JOURNAL

OF THE

Indian Medical Association

VOLUME XXIII
NUMBER 2

CALCUTTA
NOVEMBER 1953

Indian Medical Association
Central Office,
"Hanging Bridge", Daryaganj,
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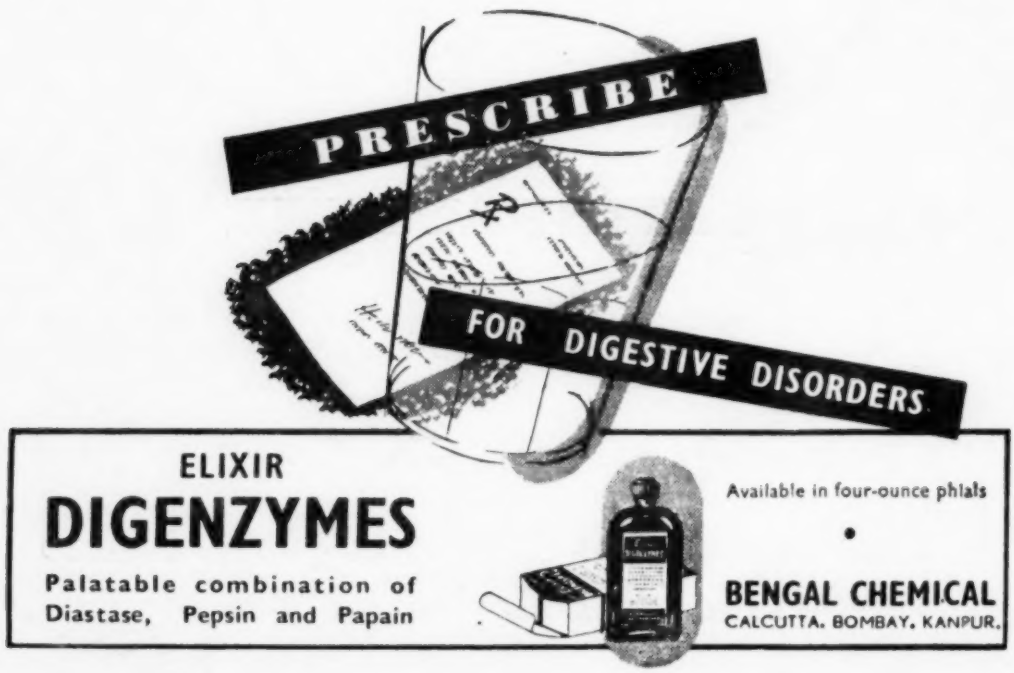

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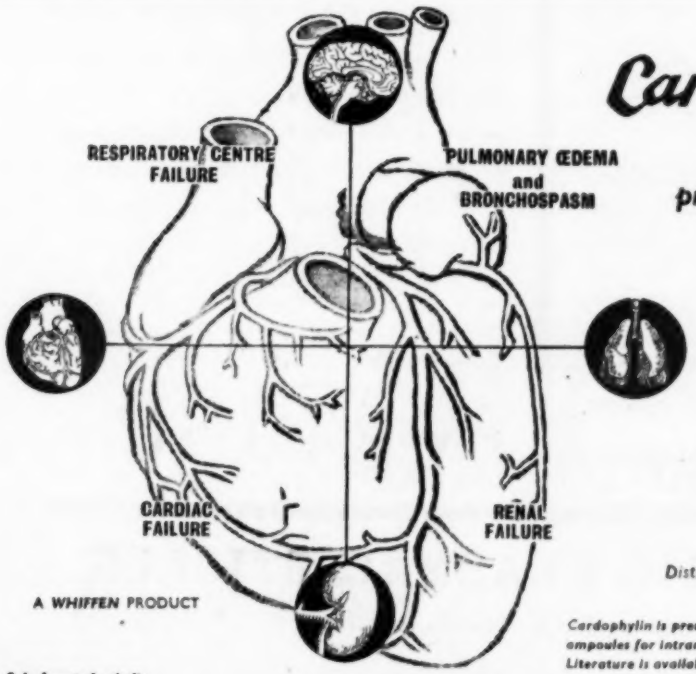

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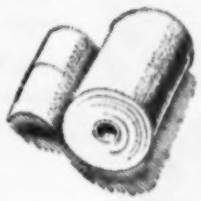

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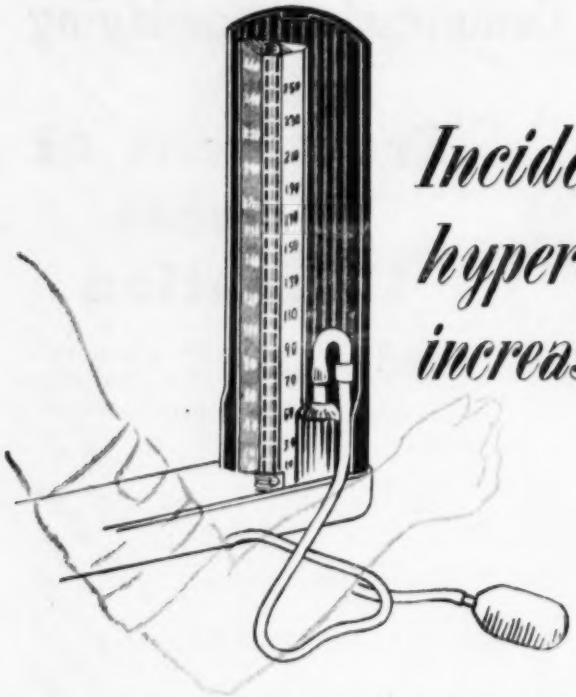

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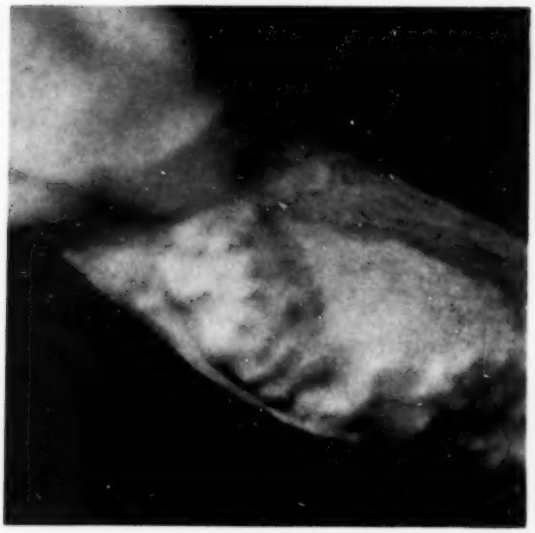

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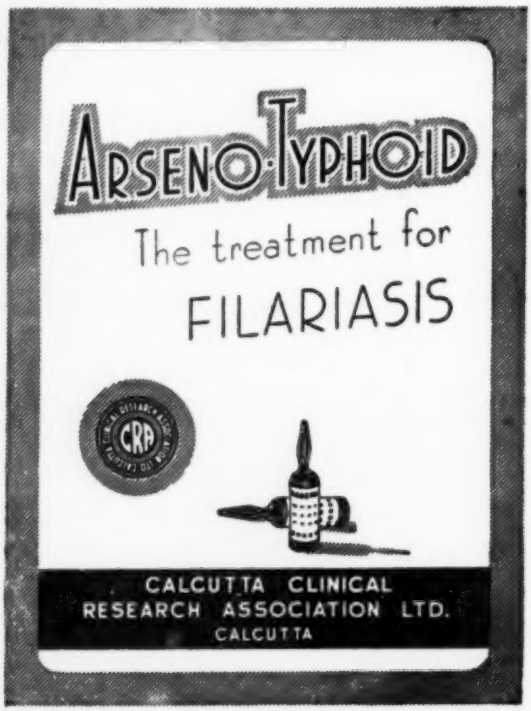

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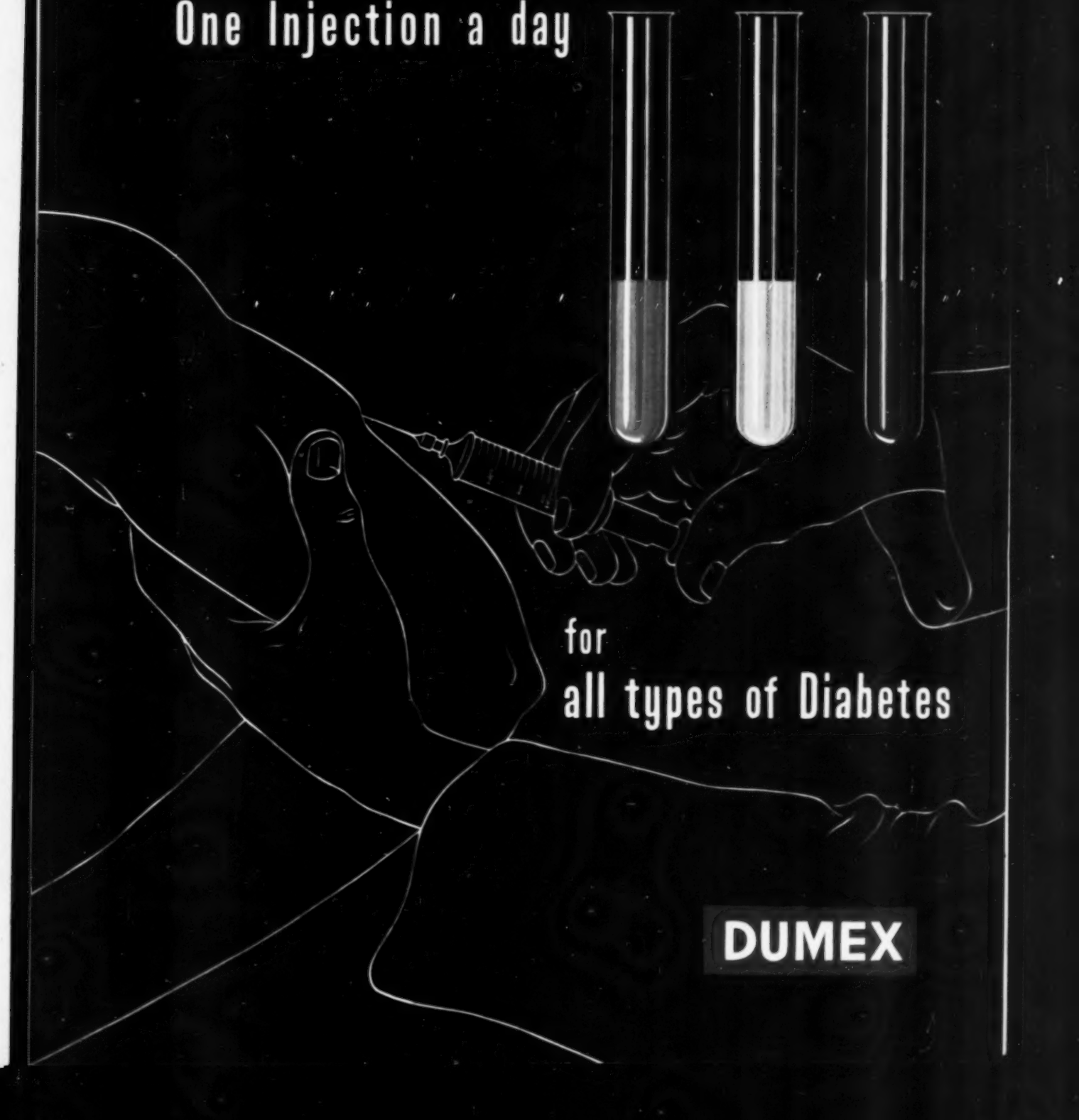

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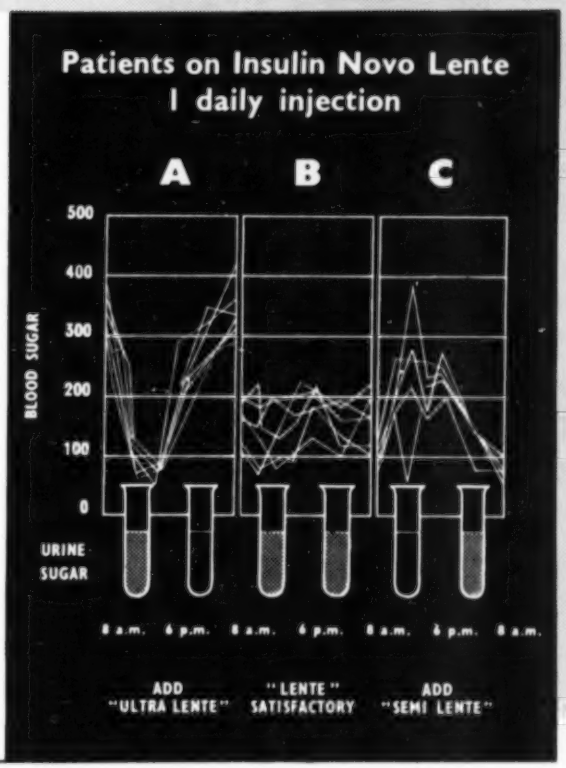
(2) from 6 p.m. — 8 a.m. "Night"

If both day & night urine are free of sugar, satisfactory control has been established and Insulin Novo Lente should be continued (see B alongside).

If day urine shows sugar, while night urine is free of sugar, a quicker effect is desirable which can be obtained by adding Insulin Novo Semi Lente in a proportion of 1:1 or 1:2 or any suitable proportion (see C alongside).

If, on the contrary, night urine shows sugar, the addition of Insulin Novo Ultra Lente (slower effect) in the proportion of 1:1 or as desired, will bring about satisfactory control (see A alongside).



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As with any "one injection a day therapy" it is necessary while using the Lente preparations to spread the carbohydrate over many meals. The following diet is suggested for general use.

Calories	2000
Proteins	70 gms.
Fats	100 gms.
Carbohydrate	200 gms.

which should be distributed as under:

8 a.m.	12 noon	3 p.m.	6 p.m.	9 p.m.
60 G	60 G	20 G	50 G	10 G

By an adjustment of the Carbohydrate distribution between the different meals, hypoglycaemic tendencies may be avoided. Thus, in patients showing this tendency at 5 p.m., the following distribution will be useful.

8 a.m.	12 noon	3 p.m.	6 p.m.	9 p.m.
20 G	60 G	60 G	50 G	10 G

or, if the tendency appears on waking, the distribution should be as under:

8 a.m.	12 noon	3 p.m.	6 p.m.	9 p.m. or later
60 G	20 G	20 G	50 G	50 G

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PACKING: Vials of 10 c.c.

NORMAL RANGE OF ACTION: 12-16 hours.

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STRENGTH: 40 units per ml.

PACKING: Vials of 10 c. c.

NORMAL RANGE OF ACTION: Over 24 hours.

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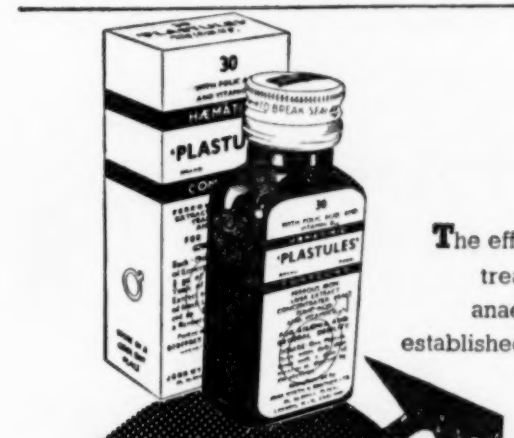

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Journal of the Indian Medical Association

VOL. XXIII, No. 2 CALCUTTA NOVEMBER, 1953

ORIGINAL ARTICLES

BENIGN AND MALIGNANT STROMATOSIS

DHIRENDRA KUMAR,

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(From the Department of Pathology and Bacteriology, Medical College, Lucknow University, Lucknow)

Stromatosis or stromatous endometriosis is a comparatively rare clinicopathological entity which is being increasingly recognised during the last thirty years.

This condition was first described by Casler in 1920 who gave it the name of 'stromatous endometriosis.' Although the earliest description was given by Doran and Lockyer (1908) under the name of 'peri-epithelioma of uterus,' Casler (1920) was first to emphasize the resemblance of proliferating intramural tissue to endometrial stroma. The knowledge about this condition has been slowly but steadily increasing. A number of cases have been reported by Goodall (1940), Robertson *et al* (1942), Miller and Tennent (1944), Goodal (1944), DeCarle (1945), Cabot (1947), Park and Tennent (1948), Park (1949a & b) reported five cases of this condition and submitted an admirable and exhaustive review of the subject based on fifty cases collected from the world literature. DaCuna (1950) reported a single case. Later on Mayeur and Alexander (1951) published two cases of their own, along with one unpublished case of Prof. Leith Murray. Lash and Lash (1951) added another case under the title of stromal myosis. Thus a total of fifty-five cases appear to have been reported in the literature.

Two cases of this condition recently studied by us are presented in this paper.

CASE REPORTS

Case 1—Mrs. V. N., aged 42 years was admitted to A. H. M. Dufferin Hospital Kanpur on 13-9-52, with the complaints of pain and mass in lower abdomen for 18 months, and difficulty in micturition and defaecation for about three months. She was married at the age of 12, and had manarche at the age of 13 years. She had three full term normal deliveries, the last being in 1938. Her periods were regular upto 1940, after which she started having polymenorrhoea for about 2 years 'D and C' was done but to no avail. In 1943 fifteen exposures of deep rays were given resulting in artificial amenorrhoea.

Examination of the patient showed her to be thin built, markedly underweight and a short statured woman. There was no change in her secondary sexual characters. Per abdomen, the parietes were thin and a freely mobile tumour, irregular in shape, was palpable in the lower abdomen. On bimanual examination the cervix appeared to be pulled under the symphysis pubis; uterus appeared to be normal in size and distinct from the tumour mass. Bilateral ovarian tumours were palpable in the fornices. Laparotomy was performed and at operation right and left ovaries were found to be replaced by tumours. Both the tumours were freely mobile. Due to the presence of solid areas in the tumours malignancy was suspected and panhysterectomy performed. No other abnormality was detected in the abdominal cavity.

The specimen when received consisted of an uterus and two "ovarion cysts." The uterus measured 8×4×2 cm., the body was small and globular in shape. The cervix appeared to be elongated and cylindrical. The outer surface of the uterus was smooth. On sagittal section a sessile polyp, size of about 1·5 cm. in diameter, was seen protruding from the posterior wall, near the fundus, and nearly filling the uterine cavity (Fig. 1, *vide* Plate). The polypus was not well demarcated from the myometrium, and presented a roughened appearance. The endocervical canal was smooth.

Both the ovarian tumours were partly solid and partly cystic. The measured 10×7×6 cm. and 12×8×6 cm. respectively. Outer surfaces of both were smooth with few injected veins. The larger tumour was mostly cystic (Fig. 1, *vide* Plate).

On sectioning the small more solid tumour, it was found to be unilocular and a number of solid masses were seen arising from the periphery and protruding into the cavity. These nodular areas were generally well demarcated and their cut surfaces appeared to be smooth, pale to bluish white in colour. The cavity was found to be filled with brown coloured thin fluid. The other larger cystic mass, which was also filled with similar fluid, showed one mass of fused nodules at one of the poles of the tumour. The cut surface of the fused nodules revealed the same appearances as seen in the small tumour.

A number of blocks were studied. Sections through the polyp and the uterine wall showed that the former was lined

by a single layer of columnar epithelium. Most of the endometrial glands were tubular, few appeared to be cystic and dilated, no secretory activity was noted. Stroma was made up of round or oval cells densely packed together.

Solid masses of cells which were oval or round in shape, strikingly uniform and closely resembling the stromal cells of the endometrium were seen distributed both in the wall of the uterus and the polyp. These masses at places were clearly demarcated and at others a direct continuity could be established between these ectopic stromal cells and those situated normally (Figs. 2 and 3, *vide* Plate).

Both the ovarian tumours, with more or less similar appearances showed highly cellular areas interspersed with loose collagenous bands. A closer scrutiny revealed that the intermingling between the two was more intimate in certain areas. In some places large groups of plump, fusiform or spindle shaped cells, at times epithelioid in appearance were irregularly scattered. These cells had oval dark nuclei, the cytoplasm was variable in amount, scanty at some places, comparatively abundant at others. In the latter case marked vacuolation gave them the appearance of paralutein cells. Frozen sections showed these cells to contain fair amount of fat droplets. Special staining revealed reticulin fibres to be wrapped round these cells. The loose fibrous bands appeared at places to consist of elongated spindle cells and at places a gradual transition to the plump oval cells could be noticed.

DIAGNOSIS: Benign stromatosis associated with bilateral thecomas of ovary.

Case 2—Patient D., aged 40 years was also admitted in the A. H. M. and Dufferin Hospital, Kanpur, with complaints of irregular bleeding for about ten months and a mass in the abdomen for two months. Clinical diagnosis of 'fibroid uterus' was made. Laparotomy was performed. Uterus was found to be studded with multiple 'fibroids' chiefly on the left side. A big nodule about 5 inches in diameter was seen protruding out of the posterior wall of the uterus and was adherent to the surrounding structures. One "interstitial fibroid" situated anteriorly at the level of the internal os had to be enucleated before the uterine artery could be ligatured.

Right adenexa appeared to be normal. The left was involved in inflammatory adhesions, though the appearances were normal. Total hysterectomy with right salpingectomy and left salpingo-oopherectomy was performed.

Macroscopically the specimen when received by us consisted of the uterus and the fallopian tube and ovary of the left side. On the outer side the uterus was nodular, irregularly enlarged and measured $13 \times 8 \times 7$ cm. in size (Fig. 4, *vide* Plate). On the posterior aspect of the uterus there was an irregular mass measuring about $5 \times 3 \times 2$ cm., whose outer surface was similar to that of the uterus, being smooth and bluish white in appearance. The other nodules on the outer surface of the uterus varied from 1 to 4 cm. in diameter. On coronal section, the uterine cavity was found to be irregular in outline due to protrusion of multiple interstitial nodules but the endometrial surface was more or less smooth. The left wall was slightly thicker and measured about 5 cm., while the right was only 3 cm. in thickness. Multiple circular or oval nodules embedded in the myometrium were clearly demarcated. They were smooth and non-trabeculated, colour varying from homogeneously pale white to goldeen yellow. In some of them the central portion appeared to be necrotic. The endocervical canal was smooth.

Microscopically all the sections cut from the uterus showed more or less similar picture. In all of them a variable portion of the endometrium was seen. It was thin and the endometrial glands were few and far between. These glands were tubular, occasionally tortuous and lined by a single layer of non-secretory columnar epithelium. The endometrial stroma consisted of small oval or round cells which were densely packed together.

In the thickened myometrium a number of irregular areas appeared to be well demarcated from the surrounding myometrium. (Fig. 5, *vide* Plate), although few of these were found to be merging with the adjacent muscle cells. Most of the areas were markedly cellular while others were almost acellular and homogeneously pink, and showing extensive necrosis.

The cellular areas presented two types of pictures. In the one, which was less common, constituent cells resembling the normal stromal cells, were round or oval in shape and were more less uniform in size. In the other groups, the constituting cells were round, oval or spindle shaped and a considerable degree of pleomorphism was noticed. A number of multinucleated giant cells was also seen (Fig. 6, *vide* Plate). The nuclei of these cells were mostly vesicular, cytoplasm being acidophilic and cell outline was indistinct. Special staining showed reticulin fibres to be wrapped round the individual cells.

The acellular areas presented a homogenously pink appearance, although at the periphery cellular deposits were noticeable having the same characteristics as that of the cellular areas.

Section from the larger nodule situated at the posterior wall of the uterus showed fibromuscular coverings at its periphery. Underneath it, there were sheets of pleomorphic cells with all the characteristics described above. Major portion of the nodule was necrosed and appeared homogeneously pink stained.

Section from the isthmial portion of the fallopian tube presented normal appearance. In the myometrium adjacent to it, there was another cellular area with same characteristics described before.

Section from the left ovary did not show any abnormality except for a small follicular cyst.

DIAGNOSIS: Malignant stromatosis.

A perusal of the literature discloses that lesions of similar nature have been described under different names. A certain amount of confusion appears to exist about this clinicopathological condition itself. Such designations as stromatous endometriosis (Casler, 1920; Browne, 1950), stromatoid new growth of the uterine wall (Park, 1949 b), stromatoid mural sarcoma (Park, 1949 b), malignant stromatosis (Novak, 1950), endometrial sarcoma (MacFarlane, 1950) and stromal myosis (Lash and Lash, 1951) have been given to more or less similar pathological conditions.

CLINICAL AND PATHOLOGICAL FEATURES

On the whole the lesion exhibits certain broad clinical and pathological features which may be enumerated and which form a common factor in most of the cases reported in the literature.

(a) *Age incidence*—The majority of cases reported in the literature fall in the second half of the repro-

ductive life. The reported cases reveal a fairly wide age incidence varying between 25 to 60 years. Both the cases reported by us were in the age group of 40 and 45 years.

(b) *Fertility*—This seems to be related with this condition in so far that most of the reported cases had had many years of preceding infertility (Goodall, 1944; Park, 1947 b; Mayeur and Alexander, 1951).

(c) *Symptomatology*—No particular symptom complex seems to be associated with the condition except that menorrhagia and increased "vaginal bleeding" was associated in about half of the reported cases. In the cases under report, menstrual disturbances were noted in both. Polymenorrhoea was noticed in Case 1 and it may be remarked that this case was associated with bilateral thecoma. It is difficult to say how far this symptom of polymenorrhoea can be attributed to stromatosis alone as these tumours (thecomas) are also reputed to produce quantitative change in the menstrual flow, during the reproductive period. In six of the cases reviewed by Park (1949 b) there was no irregularity in menstruation.

(d) *Associated findings*—Associated ectopic endometriosis either in the ovary, outer surface of the uterus and vagina was associated in 8 of the reported cases. Adenomyosis was seen in four. Case 1 under review is of rather unusual interest because of the association of bilateral thecomas of the ovary. This association may throw some light on the histogenesis of this lesion as will be discussed later on. It may also be mentioned that bilateral thecomas are unusually rare and perhaps the case under report may be the second one of bilateral thecoma, the first being reported by Falls *et al* (1949).

(e) *Size of the Uterus*—Enlargement of the uterus usually symmetrical was the main and constant finding in most of the cases. It may be pointed out that in Case 1 under report the uterus was of subnormal size with elongated cervix. In Case 2 the uterus was enlarged but irregular. Similar finding has been recorded by Mayeur and Alexander (1951).

(f) *Gross Appearances* of the uterus are characteristic in so far that the whole muscular wall of the uterus, or it may be a part of it, shows deposits of neoplastic tissue—appearing as dirty white or yellowish in colour. Its consistency is usually elastic or rubbery or rarely it may be pultaceous. On freshly cut surface it may be seen in the form of innumerable branching strands running in various directions giving a "rough towel" appearance. Occasionally the deposits are round or oval in shape and wall demarcated from the surrounding myometrium—this appearance is very clearly seen in one of our cases. In less than half the cases reported by Park (1949 b) the neoplastic tissue was found to protrude in the endometrial cavity in the form of a polyp. Case 1 under report presented this appearance (Fig. 1, *vide* Plate).

(g) *Microscopic appearances* are characteristic in so far that lying in between the muscle bundles of the myometrium, groups and columns of neoplastic cells can be seen. These cells may be in discrete group, or may show an intimate fusion with the muscular bundles. These cells resemble endometrial stroma and do not show fully developed glandular tissue.

In some the cells are characteristically uniform, round or oval with prominent nuclei and diffuse fine reticulin network surrounding them. In others the cells show marked polymorphism and other cellular characteristics of malignancy including symplasmic giant cells.

The cellular appearances of the two cases under report are worthy of close attention.

In Case 1 the myometrium was studded with a number of discrete collections of cells closely resembling normal endometrial stroma. They did not show any attempt at differentiation into glandular element nor did they exhibit any anisocytosis or anisonucleosis. A definite continuity of these similar groups with the endometrial stroma may be traced at certain sites but most of the cell groups were far removed from the normal stroma and did not show any connections with it. The uterus was regular and subnormal in size and a small sessile polyp was noticed in the uterine cavity. On the basis of histological appearances, this case represents a purely benign stromatosis of the uterine musculature.

On the other hand, Case 2 under report shows certain clear cut macroscopic and microscopic differences. The uterus was enlarged, it was irregular and asymmetrical and showed a nodule protruding into the pelvic cavity forming adhesions with the surrounding structures. The cut surface of the uterine wall also showed characteristic multiple yellowish white nodules. The microscopic picture revealed evidence of anaplasia, anisocytosis and giant cell formation—all pointing to an unquestionable malignant stromatosis.

Histogenesis

The lesion described under these various names is undoubtedly rare. The multiplicity of the names has made confusion worse confounded. If an attempt is made to clarify the present day ideas about the histogenesis of these tumours, one finds that the following different views have been advanced:

1. That the condition is a variation of adenomyosis, there being a direct invasion of the myometrium by endometrial stroma and continuity with the endometrium can be demonstrated in serial sections (Novak, 1947). While it may be so in certain cases, one has to realise that at places a sharp distinction between the neoplastic tissue and myometrium can be made out. It has also to be admitted that even if a continuity be established between the neoplastic tissue and endometrium, fairly large groups of stromal cells are seen far away from the endometrium and imperceptibly merging with muscle fibres.

2. To explain the absence of continuity of neoplastic cells with stromal cells, Park (1949 b) thinks that the neoplastic tissue has a multicentric origin *in situ*. Further support to Park's view is given by Goodall's (1944) claim, that stroma cells can always be demonstrated in the muscular wall of the normal uterus by careful examination. How far this is possible is open to question, as it appears rather difficult to be able to distinguish between stromal and myometrial cells even at the junction between the two.

3. Park in 1949 put forward another possibility —that undifferentiated cells with potentialities to develop either into endometrial stromal or glanduliform cells are distributed throughout the uterine wall, and that it is this undifferentiated embryonic tissue which is capable of taking the characters of stromatosis or endometriosis when acted upon by suitable stimulus or some carcinogenic agency. This was based on the hypothesis of Gruenwald (1943) who thought that the nonepithelial tissue of the uterogenital canal arises not only from the mesenchyme originally present in that area, but also in part from the epithelium of the inner and outer linings of the canal. Gruenwald goes so far as to say that undifferentiated and embryonic cells alone need not be credited with such developmental potentialities, for it is being realised that even the differentiated cells of the adult organism may have similar potencies. However it is impossible to attribute the origin of these neoplasms definitely to either the mature adult cells or to undifferentiated precursor cells.

4. Still another view is that stromatosis has no separate histological basis and that the reported cases are examples of sarcomatous change. The arguments put forward in support of this hypothesis are, that neoplasm may arise after menopause, that it does not undergo regression after removal of the ovaries, and lastly that there is a high percentage of recurrence after removal—facts not ordinarily met with in endometriosis. According to Park (1949 b) therefore, evidence is rather feeble to regard stromatosis as a form of endometriosis and he is inclined to look upon this condition as "stromatoid mural sarcoma."

While the histotgenesis or nature of this entity may be debatable, a study of the literature and the cases under report, leave no reason to doubt the existence of this condition as a separate pathological entity. Novak (1952a & b) has expressed the present concept about the lesion in a clear way. He is of the opinion that there are three groups of cases which are usually spoken of as stromal adenomyosis or stromatosis, etc. The first group represents the lesion which resembles ordinary adenomyosis except that the only endometrial component that invades the myometrium is the stroma, that there is complete absence of endometrial glands, and stromal elements show no evidence of anaplastic activity, the cells being closely similar to normal endometrial stroma. This lesion is both clinically and histologically benign. The tumour in Case 1 reported by us falls into this category and represents benign stromatosis.

The second group of cases of this condition are at the other extreme—the invading stroma shows marked anaplasia, wide extension, and dissemination. Case 2 reported by us falls into this category as it showed extrauterine extension of the lesion into the pelvis but there was no evidence at the time of removal of tumour of distant metastasis. This group has to be considered malignant and to be designated as malignant stromatosis. Novak (1952 a & b) however, looks upon this class of tumour as endometrial sarcoma. In our opinion it would be much better to reserve the term of endometrial sarcoma for that type of lesion where the malignant process starts from the normally situated stroma of the endometrium and later on invades the myometrium. Such few cases have been reported by MacFarlane (1950). Malignant stromatosis with all the characteristics advocated by Novak should be used when the endometrium is normal and the malignant process shows widely separated foci of anaplastic cells in between, and infiltrating the uterine muscle fibres.

Between these two extremes, Novak describes an intermediate group which in his opinion, has given rise to much confusion. This group microscopically shows no evidence of malignancy and yet it is said to possess a tendency to local invasion into the broad ligament and parametrium or even into rectum and bladder. This group is also characterised by a curious tendency to local invasion by finger-like and worm-like extension into the lymphatics and blood vessels. It was this endolymphatic invasion which led Henderson (1946) to introduce another designation namely endolymphatic stromal myosis. In Novak's (1952 a & b) opinion the cases reported by Lash and Lash (1951) and Mayeur and Alexander (1951) belong to this group.

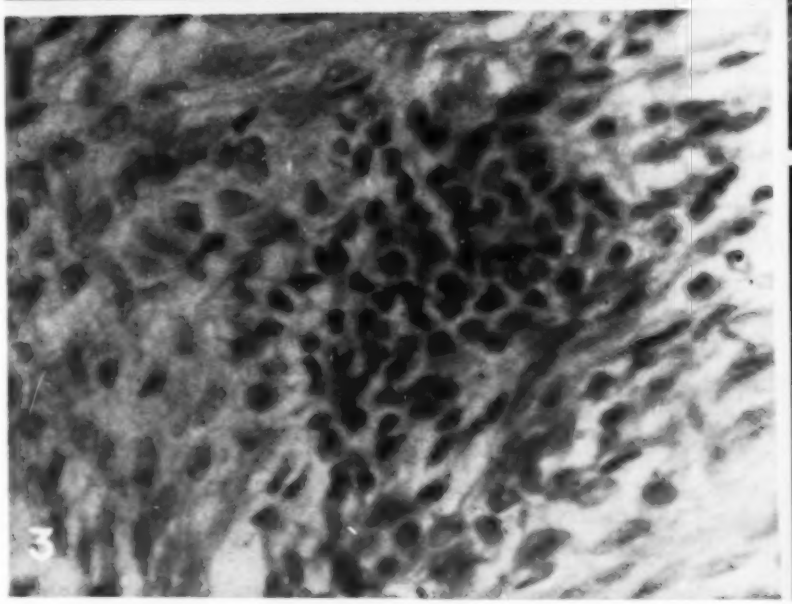
A few words may be said about the unusual association of bilateral thecoma with benign stromatosis (Case 1). Reports are not lacking in the literature where adenomyosis, uterine myomas, uterine hyperplasia and hypertrophy and even endometrial carcinoma have been found in association of theca cell tumours. These associations have been found more often than can be explained on the basis of pure coincidence (Knight, 1948). In view of the fact that Novak (1947) considered stromatosis a variant of adenomyosis, one is tempted to believe that the bilateral theca tumours in Case 1 might have played more than a possible predisposing role by virtue of their oestrogen production.

SUMMARY

1. Two cases of stromatosis, one benign and the other malignant have been described.

2. The existing literature on the subject has been briefly reviewed and histogenesis and nomenclature discussed.

3. The case of benign stromatosis showed an unusual association with bilateral theca cell tumours of the



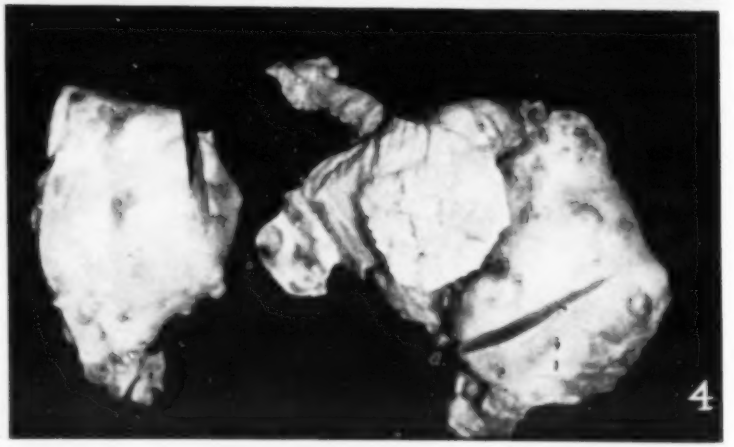


Fig. 1—Case 1—Showing uterus with a sessile polyp and bilateral ovarian tumour.

Fig. 2—Case 1—Showing an area of benign stromatosis which is well demarcated from the surrounding myometrium.

Fig. 3—Case 1—High power view of ectopic stromal cells in the myometrium—benign stromatosis

Fig. 4—Case 2—Outer surface of the uterus showing multiple nodules studded in it.

Fig. 5 (Case 2)—Well demarcated areas of malignant stromal cells.

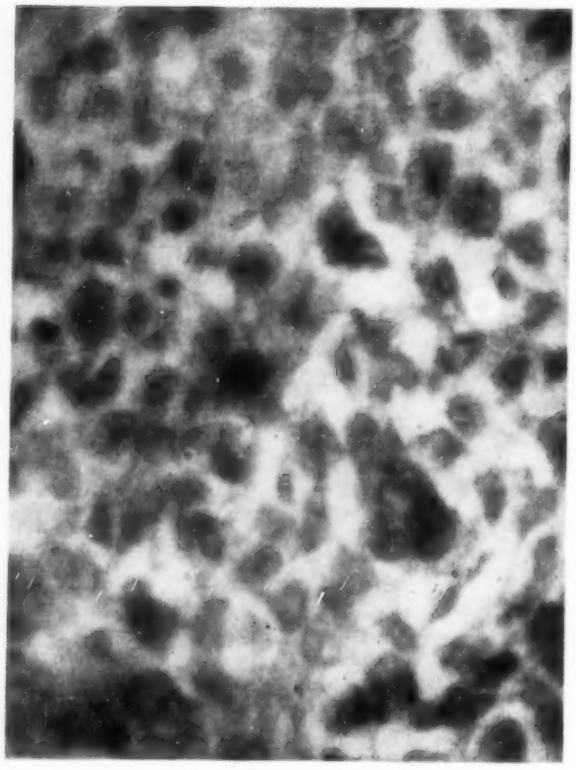


Fig. 6 (Case 2)—Areas of neoplastic stromal cells showing considerable degree of pleomorphism. A number of giant cells seen.

KUMAR ET AL—*Benign and Malignant Stromatosis* (*pp. 41-45*)

Fig. 1—Skiagram of the left clavicle showing typical onion peel arrangement of the tumour

BOSE—*Ewing's Tumour of the Clavicle* (*pp. 68-69*)

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ovary. The possible significance of this association has been discussed.

REFERENCES

BROWNE, F. J.—Postgraduate Obstetrics and Gynaecology; Butterworth & Co., (Publishers) Ltd., London, pp. 317, 1950.

CABOT—*New England J. Med.*, **236**: 835, 1947.

CASLER, DE W. B.—*Surg. Gynec. & Obstet.*, **31**: 150, 1920.

DACUNHA, F.—*J. Obstet. and Gynaec. Brit. Emp.*, **57**: 633, 1950.

DECARLE, D. W.—*West J. Surg.*, **53**: 48, 1945. (Abstract in *Am. J. Obstet. Gynec.*, **52**: 523, 1946.

DORAN, A. G. H. AND LOCKYER, C.—*Proc. Roy. Soc. Med.*, Obstet. and Gynaec. Sect. **2**: 25, 1908-9.

FALLS, F. H., RAGINS, A. B. AND GOLDENBERG, M.—*Am. J. Obstet. & Gynec.*, **57**: 1107, 1949.

GOODALL, J. R.—*J. Obstet. and Gynaec. Brit. Emp.*, **47**: 13, 1940.

GOODALL, J. P.—A Study of Endometrosis, Endosalpingiosis and Peritoneo-Ovarian Sclerosis—A Clinical and Pathological Study, 2nd Edition, Lippincott, Philadelphia, 1944.

GRUENWALD, P.—*Arch. Path.*, **35**: 53, 1943.

HENDERSON, D. N.—*Am. J. Obstet. & Gynec.*, **52**: 1000, 1946.

KNIGHT, W. R.—*Am. J. Obstet. & Gynec.*, **56**: 314, 1948.

LASH, A. F. AND LASH, S. R.—*Am. J. Obstet. & Gynec.*, **62**: 1163, 1951.

MACFARLANE, K. T.—*Am. J. Obstet. & Gynec.*, **59**: 1304, 1950.

MAYEUR, M. H. AND ALEXANDER, M. K.—*J. Obstet. & Gynaec. Brit. Emp.*, **58**: 805, 1951.

MILLER, J. R. AND TENNENT, B.—*Am. J. Obstet. & Gynec.*, **47**: 784, 1944.

NOVAK, F.—Gynecological and Obstetrical Pathology. 2nd Ed. W. B. Saunders, Philadelphia. pp. 209, 1947.

NOVAK, F.—In discussion on MacFarlane (1950).

NOVAK, F.—Editorial remarks on Mayeur and Alexander 1951) *Obstet. & Gynec. Survey*, **7**: 406, 1952 a.

NOVAK, F.—Editorial remarks on LASH AND LASH (1951), *Obstet. & Gynec. Survey*, **7**: 559, 1952 b.

PARK, W. W. AND TENNENT, R. A.—*J. Obstet. & Gynaec. Brit. Emp.*, **55**: 423, 1948.

PARK, W. W.—*J. Obstet. & Gynaec. Brit. Emp.*, **56**: 755, 1949 a.

Idem—Ibid, **56**: 759, 1949 b.

ROBERTSON, T. D., HUNTER, W. C., LARSON, C. P. AND SNYDER, G. A. C.—*Am. J. Clin. Path.*, **12**: 1, 1942.

A PLEA FOR IMMUNIZATION OF CHILDREN IN INDIA WITH COMBINED DIPHTHERIA AND TETANUS TOXOIDS

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Diphtheria and tetanus cause among the children of our country terrible suffering and a very considerable number of deaths even where modern skilled treatment is available. For instance, in the Infectious Diseases Hospital in Bombay city over 800 cases of diphtheria are treated annually, and, about 25 per cent of them die (Administration Report of the Municipal Commissioners for the City of Bombay, 1942-52). In the Medical College Hospitals in Calcutta, a large number of children are treated annually for virulent diphtheria, and over 20 per cent of them die (Das and Ghosal, 1951). These two selected instances serve to illustrate the severity of diphtheria infections in India, though the infecting strain is almost invariably the 'mitis', or the lowest virulent type (Das and Ghosal, 1951).

Tetanus is equally bad. In Bombay city, over 300 young lives are lost from tetanus every year, while more than twice that number suffer from the terrible disease (Administration Report of the Municipal Commissioner for the City of Bombay, 1942-52). In addition to this urban mortality, tetanus neonatorum and puerperal tetanus take heavy tolls in rural areas where confinement still takes place in horribly squalid conditions. Farmers in the field are also highly exposed to the risk of tetanus infections. The highly manured arable soil is full of toxigenic tetanus spores. Injuries contaminated with such a soil may cause development of tetanus.

Schoolgoing children are exposed to risks of both diphtheric and tetanus infections. In the class room, they are likely to come into contact with diphtheric carriers. In the playground, they may get cuts, pricks, and abrasions, which may get contaminated with the dust of the animal excreta surcharged with toxigenic tetanus spores.

Natural immunity against tetanus does not seem to develop at all (Lahiri, 1939), but repeated subclinical diphtheric infections produce a high-grade natural immunity. Prevalence of this natural antidiphtheric immunity among the adults of a population is, therefore, an indirect indication of prevalence of diphtheric infection in that population. Determination of diphtheria antitoxin titre of random adult populations of the city of Bombay has revealed that over 90 per cent of them contain in their sera a large quantity of naturally developed diphtheria antitoxin (Lahiri, 1952). Similarly, Schick test surveys on random Calcutta population, done by the department of bacteriology and pathology of the School of Tropical Medicine, have indicated prevalence of natural antidiphtheric immunity among the grown-ups (Mukherji and Ghosal, in press). Both of these observations indicate the frequency of diphtheric infections in this country.

That these infections were commoner in the poorer section of the population, was indicated both by the Bombay and the Calcutta surveys. Proportional to the degree of squalor, in which the poorer people lived, there were more Schick-negatives among them than among the richer community. (Mukherji and Ghosal, *loc. cit.*). Similarly, the mean diphtheria antitoxin titre was much higher in the poorer adults than in those with higher social status (Lahiri, 1952). Thus, the

natural immunity developed in the poorer adults at the cost of those among them who died of diphtheria at a young age because they could not develop natural immunity faster than the infection which killed them.

These unfortunates badly need artificial protection, At a very early age the children are highly susceptible to diphtheria. Among the Bombay children, about 90 per cent were Schick-positives till they were about 5 years old (Lahiri, 1953). If unprotected artificially, these susceptible children become the victims of the law of the jungle—survival of the fittest. That is, those that develop natural immunity fast and strong survive, while the others, who cannot, suffer and die from diphtheria. The high-grade natural immunity, which protects the bulk of Indian adults, is, thus, acquired at a considerable cost of lives lost at a very young age,

Yet, there is not the slightest doubt about the fact that both diphtheria and tetanus can be most effectively prevented by artificial active immunization with the respective toxoids. Mass immunization with diphtheria and tetanus toxoids has almost completely eliminated diphtheria and tetanus from Europe and North America.

Diphtheria had been a scourge in Europe and North America. Since the introduction of mass immunization campaigns, both incidence and mortality have been remarkably reduced. For example, in England and Wales, the number of notified cases of diphtheria averaged 50,000 a year during the period from 1911 to 1940. In 1940, the British Ministry of Health introduced its scheme of immunization of all children with diphtheria toxoid. The result was evident during the succeeding years. In 1942, the number of notified cases fell to 41,404, and, thenceforth, the fall was steadily maintained—34,662 in 1943; 29,949 in 1944; 18,596 in 1945; 11,986 in 1946; and 3,941 in 1947. (Ed. *Brit. M. J.*, **1**: 715, 1949). Proportionate with this reduction in incidence, the mortality rate also showed a drop. Prior to the campaign, the deaths from diphtheria averaged 2,500 a year. In 1942, that is two years after introduction of the campaign, the mortality rate fell to 1,827, and, thenceforth, the decrease continued: 1,371 in 1943; 934 in 1944; 722 in 1945; 472 in 1946; and 198 in 1947. This remarkable reduction in the incidence and mortality took place during the war. If naturally adds to the credit of the toxoid that in spite of food shortages, movements of population, and air raids, which prevailed during the war and increased immensely the difficulty of controlling infectious diseases, the toxoid had prevented over 92 per cent of cases and deaths during the 7 years of campaign.

Another example of the achievement of mass immunization against diphtheria is obtained from the Mortality Statistics of State Board of Health, Madison, Wisconsin, U.S.A. Till 1923, the death rate from diphtheria varied between 15 and 20 per 100,000 population all over the U. S. registered area. Mass immunization against diphtheria began in 1923 and progressed gradually. By 1930, the death rate had fallen to less than 5, and by 1940, to almost nil per 100,000 population. And at present almost every child is immunized with combined diphtheria-tetanus-pertussis vaccine before one year of age.

Tetanus had been an equally notorious scourge in the West especially during wars. For example, in the Carlist War at San Sebastian (Alcock, 1838) the incidence of tetanus was as high as 22 per 1,000 wounded. In the first World War, the incidence was 8 per 1,000 before introduction of serum prophylaxis, while the gross incidence was 1·47 per 1,000 including those protected with prophylactic tetanus antitoxin (Medical History of War, 1932). Introduction of active immunization with tetanus toxoid during the second World War had reduced the incidence dramatically. Two examples would illustrate the extent of such reduction: (a) Smith (1942) reports of a London sector where only 7 cases of tetanus were notified during the first two years of war. Analysis of these 7 cases showed that none of these had received tetanus toxoid, but a prophylactic dose of tetanus antitoxin had been given in 6 cases. (b) Boyd and Maclennan (1942) in the Middle East observed an incidence of 0·13 per 1,000 wounded among the troops, who were immunized with tetanus toxoid, against an incidence of 1·6 per 1,000 among others. Tetanus toxoid had, thus, prevented tetanus, during the stress and strain of war, as effectively as diphtheria toxoid had prevented diphtheria.

There is no reason why mass immunization schemes would not show such brilliant results in India. Children are highly susceptible both to diphtheria and to tetanus. It is certainly much more preferable to immunize them artificially at no risk at all, than to let them develop natural immunity at the very grave risk of disease and death.

Of course, the older varieties of diphtheria prophylactics, such as the A.P.T., cause bad reaction, both local and general. These reactions scare many parents away, and these parents are naturally reluctant to submit their children to certain suffering to protect them from a danger which they do not foresee. The new diphtheria prophylactic, N.A.F.T., is, however, completely free from reactions (Lahiri, 1953), and a mixture of N.A.F.T. and tetanus toxoid is almost as harmless as plain water. There is, therefore, no fear of any resistance movement developing against such a harmless immunization scheme.

The scheme would not involve any additional administrative set up. Every big city in India is well provided for vaccination and re-vaccination of children. In addition to vaccination, inoculations with cholera vaccine, or with T.A.B. and plague vaccines, are frequently given by the same organisation in times of necessity. This very same organisation could easily

shoulder the additional task of immunization of children with the combined diphtheria and tetanus toxoids.

Preliminary immunization consists of two doses of the mixed toxoids given at an interval of six weeks. The first dose could be given at the time of vaccination. The second dose should be given six weeks later, but if some of the children fail to report six weeks later, the second dose may be given at the next opportunity, that is whenever the children attend the same or other immunization centres. Absolute harmlessness of the mixed toxoids make them eminently suitable for injection with any other antigen, living or dead.

Even if the second dose were not given at all, a very large percentage of children would still be protected against diphtheria. Field trials with the N.A.F.T. have shown that even a single dose of the diphtheria prophylactic can convert between 90 and 100 per cent of Schick-positives into Schick-negatives (Lahiri, 1953). Tetanus toxoid would, however, need repetition to produce effective immunity. Nevertheless, one certain dose, and perhaps a delayed second dose, is preferable to no immunization at all.

This preliminary artificial immunization, if supplemented by the natural immunizing stimuli of repeated sub-clinical infections, could confer permanent immunity. However, the children, who are brought up in an environment unlikely to supply the natural immunizing stimuli, should be fortified with "booster" doses of the mixed toxoids every five years, or perhaps even earlier if the risk of infection appears to be very severe.

Thus, the sure and certain protection against diphtheria and tetanus could be purchased almost at no cost. Even the preparation of the mixed toxoids would not involve the State into considerable expenditure. Large scale production of these two toxoids could be taken up by the State bacteriological laboratories at a very small additional cost. Virtually the cost of the toxoid is about the cost of the medium in which the toxoid is produced. Half a seer of meat and 10 to 20 g. of peptone gives 1,000 ml. of the medium, and at least 500 ml. of the potent processed toxoid. A small quantity of the required chemicals and a few filter pads add very little to this cost. In a properly staffed bacteriological laboratory, the existing staff could take up production of fairly large quantities of the toxoid. Hence overhead charges would be nothing. However, it would be essential for all laboratories, not doing this type of work at present, to procure the required modern, sensitive, and precision equipment without which toxoids of standard quality could never be produced. Suitable glass-lined steel containers, precision sterilizers, filters, air-conditioned inoculation room, incubation and cold-storage rooms, a good animal house, and a large stock of neutral and resistant glass vessels, containers, and ampoules, are amongst the essential and indispensible prerequisites to production of large and constant quantities of good toxoids of standard quality.

Purchase of these prerequisites would naturally involve considerable capital expenditure. However, these few thousand rupees spent by the State would bring priceless returns in the shape of thousands of children reclaimed from disease and death due to diphtheria and tetanus. This is perhaps an example of investment in which the money spent is surely and amply returned in kind far superior to coins.

REFERENCES

Administration Report of the Municipal Commissioner for the City of Bombay, 1942-1952.

DAS, A. AND GHOSAL, S. C.—*Lancet*, **1**: 1410, 1951.

LAHIRI, D. C.—*Indian J. M. Res.*, **27**: 581, 1939.

Idem—*Indian M. Gaz.*, **87**: 448, 1952.

MUKHERJI, A. AND GHOSAL, S. C.—*Bull. School of Tropical Medicine. (In press).*

LAHIRI, D. C.—*Brit. M. J.*, **1**: 370, 1953.

EDITORIAL—*Brit. M. J.*, **1**: 715, 1949.

ALCOCK, R.—Notes on the Medical History and Statistics of the British Legion of Spain, London, 1838, p. 99.

Medical History of the War, 1922.

SMITH, E. J. R.—*Proc. Roy. Soc. Med.*, **35**: 340, 1942.

BOYD, J. S. K. AND MACLENNAN, J. D.—*Lancet*, **2**: 745, 1943.

ENTERIC FEVER IN BOMBAY—TEN YEARS' REVIEW OF LABORATORY DIAGNOSIS

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Amongst the obscure types of pyrexia that are commonly met with in a general hospital or that confronts the general practitioners most in this country, the enteric group will probably account for the majority, chiefly because they are clinically very atypical. Bombay city accounts for nearly 1,000 notified cases of enteric fever per year. The widespread epidemic of 1937 attracted considerable attention of the Government and Municipal Health authorities and since then various steps have been taken and facilities provided for its free and early diagnosis and prompt notification; but it has not so far been completely uprooted and has now assumed an endemic form with its peak incidence during the months from June to November every year.

For the first time, with the epidemic prevalence in June 1938, this Institute was asked to investigate into sources and mode of this outbreak and to do free laboratory diagnosis of suspected typhoid cases in collaboration with the Municipal Health authorities. Accordingly, on receipt of a call from a medical practitioner an officer of the Institute visited the patient in his home and collected blood sample for Widal test and clot culture. This practice continued till the beginning of 1941 when it had to be discontinued during war, on account of shortage of medical officers.

Thus later on blood samples were collected and sent by practitioners themselves to the Institute. The incidence of typhoid in Bombay again rose during the years 1947 and 1948 and Government sanctioned a typhoid scheme with additional staff and a car with which the old practice of blood collection was resumed. The scheme started functioning from middle of June 1948 and free diagnostic aid was rendered as before in every case of pyrexia of five days' duration. In addition to blood collection, every case was examined clinically by the same doctor and history carefully recorded. This paper mainly deals with a consistent record of ten years of laboratory investigations of enteric fever in Bombay along with various problems in that connection requiring modifications of methods and techniques from time to time.

Method of Investigation

The chief diagnostic methods that were used in this laboratory were: (1) blood culture using whole blood; (2) blood culture using clotted blood; (3) triple Widal test; (4) total and differential leukocyte count; (5) Vi agglutination test; (6) urine and stool cultures. The Institute officer visiting the patient in his home, drew 10 cc. of blood aseptically from the vein of an adult case and 5 cc. from that of a child. Half the quantity of this was inoculated on the spot for whole blood culture in 100 cc. of a suitable medium and the other half left for clotting for Widal test and clot culture. The media used for blood and clot culture varied from time to time depending on the results obtained and the difficulties that arose. Various media such as glucose broth, bile broth, sterile ox bile, Hartley's broth, glycerine-peptone bile, saponin broth were tried from to time and the combination of two media such as Hartley's broth and glycerine-peptone bile has given most satisfactory results. As a routine, both blood and clot cultures were tested for growth, first after 24 hours, then after 48 hours and if still negative, after 5 days. Final identification of the organism isolated was carried out by biochemical and high titre agglutination tests. A triple Widal test was carried out using Dreyer's technique based on the qualitative method of Felix. Standardized suspensions containing H and O antigens of *B. typhosum* and H antigen of *B. paratyphosum A* and *B* were prepared at the Institute and used for the test. In addition to the Widal test for enteric group of fevers, same sera were also examined by agglutination test for Brucellosis and typhus infection. Vi agglutination test was carried out by using live suspensions from 'ViI' Bhatnagar strain (Soman, 1945). Blood for total and differential count was collected as a routine for some time with a view to find out its significance as a diagnostic measure. Urine and stool were plated on media like MacConkey's, litmus lactose agar, D.E.C. and bismuth sulphite agar; out of these D.E.C. and bismuth sulphite agar gave most satisfactory results. In spite of repeated requests and free facilities offered, the hospital authorities or private practitioners rarely took this opportunity of diagnosing their cases by stool or urine cultures, when Widal and blood cultures were reported negative, and as a result of this poor response, hardly any samples of these were received for routine investigations.

Results

During the last ten years, the Institute examined 15,235 samples of blood, both by culture and Widal tests. Out of these, 6,042 (40 per cent) were diagnosed as enteric by both the tests, 3,885 (26 per cent) by Widal test alone and 2,157 (14 per cent) by culture alone. Of 2,157 positive cultures, 1,918 were identified as *B. typhosus* and 239 as *B. paratyphosus A*. No *B. paratyphosus B* or *B. paratyphosus C* was recovered in blood cultures in all these years under investigation. Other organisms that were occasionally isolated from blood cultures were *B. coli*, *B. faecalis alkaligens* and other types of salmonella such as *B. enteritidis* and *B. typhi murium*, belonging to food-poisoning group. The strains of *B. typhosus* and *B. paratyphosus A* isolated conformed to the usual biochemical and agglutination patterns, but an occasional strain of *B. typhosus* failed to produce H_2S while *B. paratyphosus A* produced H_2S when further tested. This was proved and confirmed by various other tests. Amongst the large number of negative Widal sera and sterile blood cultures, 6 per cent of sera were found to be positive for rickettsial infection by Weil-Felix reaction being chiefly 0×19 in type. This record was available since 1943 and over 9000 sera were examined for Weil-Felix test and 538 of these were positive. Similarly the routine testing of these sera for Brucellosis infection, since 1945, showed that only twelve sera out of 6,000 tested were positive (0·2 per cent).

Table 1 illustrates the number of sera tested for Widal and culture year by year and the positive results obtained.

Table 1—Showing Widal and Culture Tests Year by Year and the Positive Results Obtained

Year	*Total samples*	*Widal positive*	*B. typh.*	*Culture para A*	*para B*	*Positive para C*
1938	705	385	89	10	...	...
1939	1022	421	127	21	...	...
1940	1195	324	167	34	...	...
1941	1005	154	62	13	...	...
1942	811	208	132	15	...	...
1943	1866	345	229	23	...	...
1944	1738	488	184	20	...	...
1945	1566	252	192	18	...	...
1946	1561	249	185	14	...	...
1947	1575	359	185	27	...	...
1948	2191	640	366	44	...	...
	15235	3885	1918	239	...	...

A critical analysis of this data in a representative group of 3,776 cases suffering from enteric infection showed that the number of Widal positive cases was 999 (26·5 per cent) and the number of Widal negative cases was 332 (8·8 per cent), when only one single examination of blood was carried out during the course of

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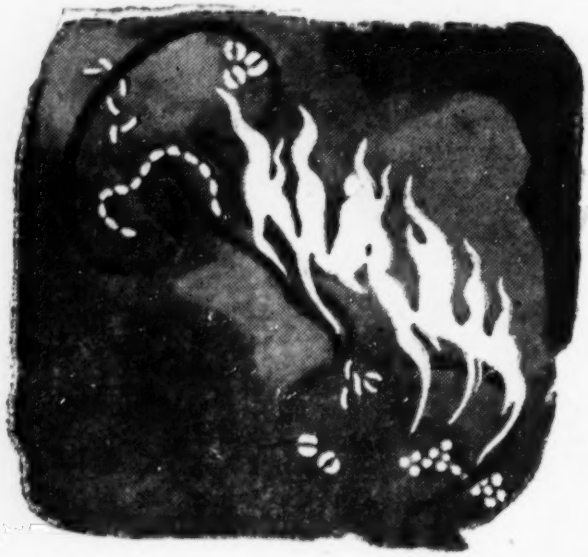

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typhoid infection. This fact is significant which shows that 8 per cent of the positive cases will be missed completely if no blood or clot cultures were done at the same time. Table 2 illustrates this.

TABLE 2—SHOWING THE DRAWBACK OF ONLY ONE BLOOD EXAMINATION DURING THE COURSE OF TYPHOID INFECTION

Total No. of samples	Widal + ve Culture + ve	Widal − ve Culture + ve	Widal + ve Culture − ve	Culture + ve: B_3 typh.	Culture + ve: B. para A
3766	290 (7%)	332 (8%)	709 (18%)	551 (15%)	71 (2%)

Total and differential leukocyte counts: As mentioned above, total and differential counts were not done as a routine but these were done only at the time blood was collected for Widal and culture and the findings were analysed in a small group of 93 cases with a view to find out their diagnostic significance. As will be evident from Table 3, the results obtained by the total counts were rarely consistent with the text book description.

TABLE 3—SHOWING DIAGNOSTIC SIGNIFICANCE OF TOTAL AND DIFFERENTIAL COUNTS IN TYPHOID FEVER

Total WBC count	Number of cases	
Between 1,000 and 5,000	36	
,, 5,000 ,, 8,000	41	57
,, 8,000 ,, 11,000	16	

Thus 57 cases out of 93 proved to be enteric fever did not show any significant leucopenia, the diagnostic feature of which was so often stressed in text books and in wards. The differential count studied in all these cases, however brought out the fact of relative lymphocytosis, the extreme variation being 15 to 82 per cent. Following is the average differential count in an enteric fever case:

Polymorphs 57 per cent, Lymphocytes 37 per cent, Monocytes 6 per cent, Eosinophils nil.

Special investigations: While carrying out different laboratory procedures for the diagnosis of enteric fever, a number of problems arose which required further investigation.

The selection of a suitable blood and clot culture media for the isolation of enteric organisms predominantly engaged our attention; similarly, whether the whole blood or the clotted blood gave more successful positive isolations, was another problem. 100 cc. glucose broth and 10 cc. of pure ox bile were the media used originally for blood and clot culture respectively; later it was replaced by bile broth, Hartley's broth and glycerine-peptone bile. Penfold and his colleagues (1940) using a battery of media including saponin broth, obtained diverse results in 160 routine blood cultures, the results depending on the nature of the infecting organism. Since saponin broth was shown by them to be selective for the isolation of streptococcus and comparable at least with other media in the isolation of *B. typhosus*, this medium was tried along with other two, such as glucose broth and bile broth. Saponin broth was found to be actually inferior to the bile media for isolation of typhoid and paratyphoid organisms (Soman, 1946). Comparative study of glucose broth and Hartley's broth had shown that the latter worked more satisfactorily than the former and since then it has been accepted as a routine blood culture medium. The clotted blood and the whole blood when cultured in the same medium without bile, showed no advantage of one over the other but the addition of bile enhanced the value of clotted blood for culture. 424 samples were examined both by whole blood culture and clot culture methods using identical quantity of blood for each test. Of these, 132 samples were bacteriologically positive for enteric infection and of these 113 were specially studied and analysed with a view to find out the comparative value of whole blood and clotted blood cultures. Table 4 illustrates the figures obtained.

TABLE 4—SHOWING COMPARATIVE VALUE OF POSITIVE WHOLE BLOOD AND CLOTTED BLOOD CULTURES

Total + ve cultures	Only clot culture + ve	Only blood culture + ve	Both blood and clot cultures + ve
113	28	18	67

Thus total blood cultures positive $18 + 67 = 85$ (76 per cent) and total clot cultures positive $28 + 67 = 95$ (85 per cent).

Hence if a single method of blood culture was adopted, 10 positive cultures would have been missed. This showed that clot cultures offered better chances of successful isolation than whole blood cultures.

Relative time in the appearance of growth in 152 positive whole blood cultures and 162 clotted blood cultures was also studied. The clotted blood cultures and whole blood cultures examined at the end of 24, 48 hours and 5 days for evidence of any growth and earliest period at which it secured the results are summarized in Table 5.

TABLE 5—SHOWING RELATIVE TIME IN THE APPEARANCE OF GROWTH IN WHOLE BLOOD AND CLOTTED BLOOD CULTURES

Whole blood culture positive	Clot culture positive
24 Hours 47 (30·9 per cent)	118 (72·9 per cent)
48 Hours 85 (55·9 per cent)	33 (20·3 per cent)
5 Days 20 (13·2 per cent)	11 (6·8 per cent)
152	162

From Table 5, it can be seen that 72·9 per cent of positive isolations were obtained at the end of 24 hours by clot culture technique as against 30·9 per

cent by whole blood cultures. Whereas the ratio was reversed when percentage of positive isolations of 48 hours and 5 days was considered together, *viz.*, 55·9 per cent of positive isolations were obtained by blood culture as against 20·3 per cent by clot culture method. Besides, it was demonstrable that at least 6·8 per cent of positive cultures were obtained by clot culture and 13·2 per cent by blood culture on the 5th day. So far as the enteric group is concerned, the clotted blood using glycerine-peptone bile medium was a better successful medium for 'blood culture' than the whole blood similarly used.

The Problem of Contaminated Clot Cultures

In the absence of a collecting unit, blood was collected by private practitioners themselves and sent to us for Widal reaction and clot culture. As a result of this, the routine use of clot cultures in simple ox bile medium presented a serious problem inasmuch as 50 per cent of these were found to be grossly contaminated by aerial and skin contaminants, such as *Staphylococci*, Gram positive sporebearing bacilli, *B. pyocyaneus*, etc. Under these circumstances, a necessity for finding out some medium that would suppress the growth of contaminants, without inhibiting the multiplication of typhoid bacillus, was felt. Three different media, *viz.*, bismuth-sulphite broth, D.E.C. broth and glycerine-peptone bile were tried in succession. The first two were modified Wilson and Blair's bismuth-sulphite agar and D.E.C. agar respectively by substituting agar base of both with the nutrient broth. Table 6 illustrates the results with different media for contaminated clot cultures.

Table 6—Showing Results with Different Media for Contaminated Clot Cultures

Medium	*No. of total cultures*	*% of contaminated clot cultures*	*% of sterile cultures*	*% of positive cultures*
Simple ox bile	3422	47	38	15
Bismuth sulphite broth	735	24	63	13
D.E.C. broth	335	25	62	13
Glycerine peptone bile	1562	20·9	65·6	14·5

These results showed that the percentage of contaminations had been brought down from 47 to 21 per cent, while the percentage of positive isolations has remained the same. Typhoid and paratyphoid A organisms would be grown easily in all the three media. Glycerine-peptone bile medium proved superior to simple ox bile in markedly reducing the chance of contamination and being cheap and simple to prepare, it was adopted for routine use of clot cultures.

The Value of D.E.C. Medium in the Isolation of Intestinal Pathogens

The problem of routine isolation of enteric group of organisms from urine and faecal specimens, is one of vital importance from a clinical and public health standpoint. An efficient selective medium or a combination of such media is essential for the successful isolation of a causative organism. Only three media *viz.*, MacConkey's agar and litmus-lactose agar and Wilson and Blair bismuth sulphite agar were in routine use. The latter, though selective, suffered from certain drawbacks; the medium had to be prepared fresh each time, the growth required at least 48 hours, the colonies on the plate were unfit for the slide agglutination immediately and certain strains of *B. typhosus* were unduly sensitive and failed to grow on the medium. Panja and Ghosh (1943) described a modified desoxycholate citrate (D.E.C.) agar which could easily grow the three most important intestinal pathogens *viz.*, *B. dysentery, B. typhosus* and *B. paratyphosus A* and *B* and *V. cholera*. This medium was, therefore, given a trial along with the other three previously mentioned. The number of samples examined and compared was 37, out of which 35 came from convalescent typhoid patients prior to their discharge from hospitals. The positive results are illustrated in Table 7.

Table 7—Showing Positive Results

No. of samples found positive	*D.E.C. positive*	*B.S.A. positive*	*MacConkey positive*	*L.L.A. positive*
11	10	8	0	0

The gross failure of non-selective media and the corresponding success in isolating on the selective media strongly suggested that the organisms excreted in faeces probably were in small numbers. Actually D.E.C. medium obtained two more positive isolations than those obtained from B.S.A. plate. D.E.C. medium has been adopted as a routine selective medium for isolation of any intestinal pathogens.

Vi Agglutination in the Diagnosis of Typhoid Fever

The serological diagnosis of typhoid fever is based on the conventional Widal test using H and O antigens of B. typhosus. The discovery by Felix and Pitt (1934) of a Vi antigen of *B. typhosus* and a suitable strain of Vi by Bhatnagar (1938), rich in Vi antigen, opened up a new serological approach to the problem of diagnosis of typhoid fever. Bhatnagar (*loc. cit.*) showed the development of Vi agglutinins in acute typhoid cases whether inoculated or uninoculated to be very regular and suggested that this test might well supplant the routine H and O agglutination. The problem was taken up by the senior author (1945) and after determining the Vi agglutinin content of sera from non-pyrexial and random samples of blood, 75 bacteriologically proved typhoid cases were examined for O, H

and Vi agglutination and the results were compared as to their diagnostic value. Vi agglutination test alone could diagnose only 61·3 per cent of typhoid cases while 93 per cent of these could be diagnosed by the presence of O and H agglutination. In 5 per cent cases, the diagnosis was solely arrived at by the isolation of *B. typhosus* from clot cultures as none of these antibodies could be demonstrated. It was concluded that in cases of typhoid fever, uninoculated with T.A.B. vaccine and with only a single serological examination available, Vi agglutination test by itself was found to possess hardly any diagnostic value and was actually inferior in that respect to the routine combined method of clot culture and O and H agglutination and hence it was abandoned as it also involved greater technical difficulties *viz.*, maintenance of special media, etc.

Before the results of various laboratory procedures are interpreted and discussed, it is absolutely essential to stress repeatedly certain aspects of this work. A single blood examination during the course of enteric infection was all that was available although repeat blood examinations should be the rule. The Bombay population greatly increased during the year of second World War and it continued to be so, even after the cessation of hostilities on account of the recent refugee problem. T.A.B. inoculation in Bombay, though carried on voluntarily, is not expected to be regular and adequate, as such for practical purposes of spread of infection, the population remains susceptible. These three aspects will have to be necessarily borne in mind in the interpretation of results obtained from single Widal test or single blood and clot culture. Similarly the relationship of these two laboratory procedures to the day of fever on which blood is collected will have to be considered in the same light. A common practice for doctors in hospitals or outside, to be strongly deprecated, is to send samples of blood for Widal or culture without any reference to the day of fever on which blood is collected or with no reference to history of T.A.B. inoculation.

But wherever this information was ascertained or was available it was utilised for purposes of analysis and it showed that 75 per cent of samples of blood were received for examination after the end of the 1st week and only 25 per cent were received within the 1st week.

The Table 8 illustrates the relationship of the day of fever to the Widal and culture week by week.

It is evident from Table 8 that 112 cultures could be obtained from 371 samples examined. Out of these 112 cultures isolated in the 1st week of illness there were only 28, the remaining 84 being from 2nd week onwards. It is not at all suggested here that 2nd week or after offers any better chance for positive cultures than the 1st week. These figures will have to be considered in terms of the number of samples received week by week. But it is a significant finding that even as late as 3rd or 4th week, positive blood or clot cultures could be obtained and this was reported before by the senior author (1932 and 1934), which would mean that any sample of blood collected for diagnosis of enteric fever during the course of infection should be examined by Widal and whole blood or clot culture irrespective of the day of fever on which the sample is collected. Similarly 67 per cent and 37·5 per cent of samples of blood from 112 bacteriologically proved cases were positive for O and H agglutination respectively. Even when O agglutination and H agglutination results are considered in relation to the day of fever or week by week, it can be easily seen that the former are more consistent than the latter and this is not surprising in view of the recorded observations regarding the evanescent character of H agglutinins in typhoid infection. Besides 33 per cent of O agglutination results and 62·5 per cent of H agglutination results were either negative or below a titre of 1:50. These observations significantly stress the importance of repeated observations in contrast to a single examination or observation and as the results obtained by a single Widal test are not often dependable, a blood or clot culture should always be asked for in addition. This procedure will also be helpful in arriving at the proper diagnosis of inoculated cases in which even two or more Widal tests may not be helpful.

TABLE 8—SHOWING RELATIONSHIP OF THE DAY OF FEVER TO THE WIDAL AND CULTURE TESTS

Total No. of samples week by week	*Day of fever*	*Positive cultures*	*'O' agglutination*		*'H' agglu*
			Below 1:50	*1:250 & above*	*Below 1:50*
91 (24·5%)	1-7 days	28	11	17 (60%)	19
201	8-14 ,,	60	15	45 (75%)	3'
66	15-21 ,,	16	8	8 (50%)	
13	22-28 ,,	8	3	5 (62%)	
371		112	37	75	

Summary

(1) A collective data of ten years, dealing mainly with the blood culture using either whole blood or clotted blood and Widal test in suspected cases of enteric fever has been presented and analysed; 40 per cent of these cases proved to be of enteric infections and 6 per cent typhus infections.

(2) Among the enteric group of organisms, *B. typhosus* was the most predominant type, next in order of importance being *B. paratyphosus A* in the ratio of 9:1; no strain of *B. paratyphosus B* and *B. paratyphosus C* was met with during these ten years.

(3) The analysis clearly showed that one-third of the bacteriologically proved typhoid cases gave negative Widal reactions. Such Widal negative cases would be missed if no blood and clot cultures are routinely done.

(4) Both blood and clot cultures should be done as a routine as the results of both are not always identical.

(5) A comparative study of whole blood culture and clot culture showed the superiority of the latter especially in the presence of bile in the medium and its advantage when only a single sample was available for examination.

(6) A combined method of clot culture and Widal reaction for H and O agglutination was shown to have better diagnostic value than Vi agglutination test alone.

(7) Hartley's broth and glycerine-peptone bile media have been found to be quite satisfactory for routine blood and clot culture respectively. The latter has also been found to reduce the number of contaminated clot cultures.

(8) D.E.C. medium was shown to be a valuable adjunct to bismuth sulphite agar medium for faecal cultures or in dealing with contaminated blood or clot cultures.

(9) Total and differential counts done only once, during the course of infection showed no diagnostic value.

(10) The value of repetition of a test either Widal or culture or count is stressed in the diagnosis of typhoid fever especially when the first report is negative.

References

Bhatnagar, S. S.—*Brit. M. J.*, **2**: 1195, 1938.

Felix, A. and Pitt, R. M.—*Lancet*, **2**: 186, 1934.

Panja, G. and Ghosh, S. K.—*Indian M. Gaz.*, **78**: 43, 1943.

Penfold, J. B., Goldman, J. and Fairbrother, R. W.—*Lancet*, **1**: 65, 1940.

Soman, D. W.—*Indian M. Gaz.*, **67**: 15, 1932.

Idem—Ibid, **69**: 572, 1934.

Idem—Ibid, **79**: 479, 1944.

Idem—Ibid, **80**: 90, 1945.

Idem—Ibid, **81**: 121, 1946.

4 (3'-DIETHYLAMINO-METHYL-4'-HYDROXYANILINO)-7-CHLORO-QUINOLINE ("CAMOQUIN") IN THE TREATMENT OF GIARDIASIS

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Giardia intestinalis which is an inhabitant of the duodenum and jejunum is usually considered to be a pathogenic organism though it may occasionally be found in the faeces of a healthy individual.

Gardiasis is quite common and is particularly so in children. Its symptoms usually are anorexia, flatulence, abdominal pain with bouts of loose motions. In children there may be in addition anaemia, loss of weight, irregular fever, increased appetite in some cases and the abdomen on examination may have a doughy feel. The faeces are bulky, semiliquid and pale white and often contain mucus but no blood.

The clinical diagnosis is confirmed by the microscopic examination of the faeces, which reveals the organisms in the vegetative and/or cystic forms.

Stovarsol, carbarsone, treparsol, yatren, etc., have been tried in giardiasis without success. Martin (1937) noted that patients suffering from malaria but showing Giardia intestinalis in their faeces in addition, were freed of the latter when they were treated with atebrin for their malaria. Hartman and Kyser (1941) achieved complete success in treating giardiasis with atebrin. Mepacrine is now the standard drug for the disease. The usual adult dose is 0·1 g. three times daily for 5 to 7 days. It may produce yellow discoloration of the skin and there may be toxic symptoms like nausea, vomiting and abdominal pain. But the dreaded complication is the toxic psychosis which is fortunately rare. De'Muro (1939) found a hydrocholate of an acridine compound (acranil) to have higher therapeutic value than atebrin in giardiasis. Soberon Y Parra and Peláez (1950) used pastilles containing 0·1 g. of chloroquine three times a day for 5 days in 64 patients with giardiasis. The parasites recurred in only 5 of the 37 patients who were under observation for several months. Mein (1951) while using camoquin in the treatment of malaria found the drug to have a marked effect on Giardia intestinalis. Muller *et al* (1952) in treating

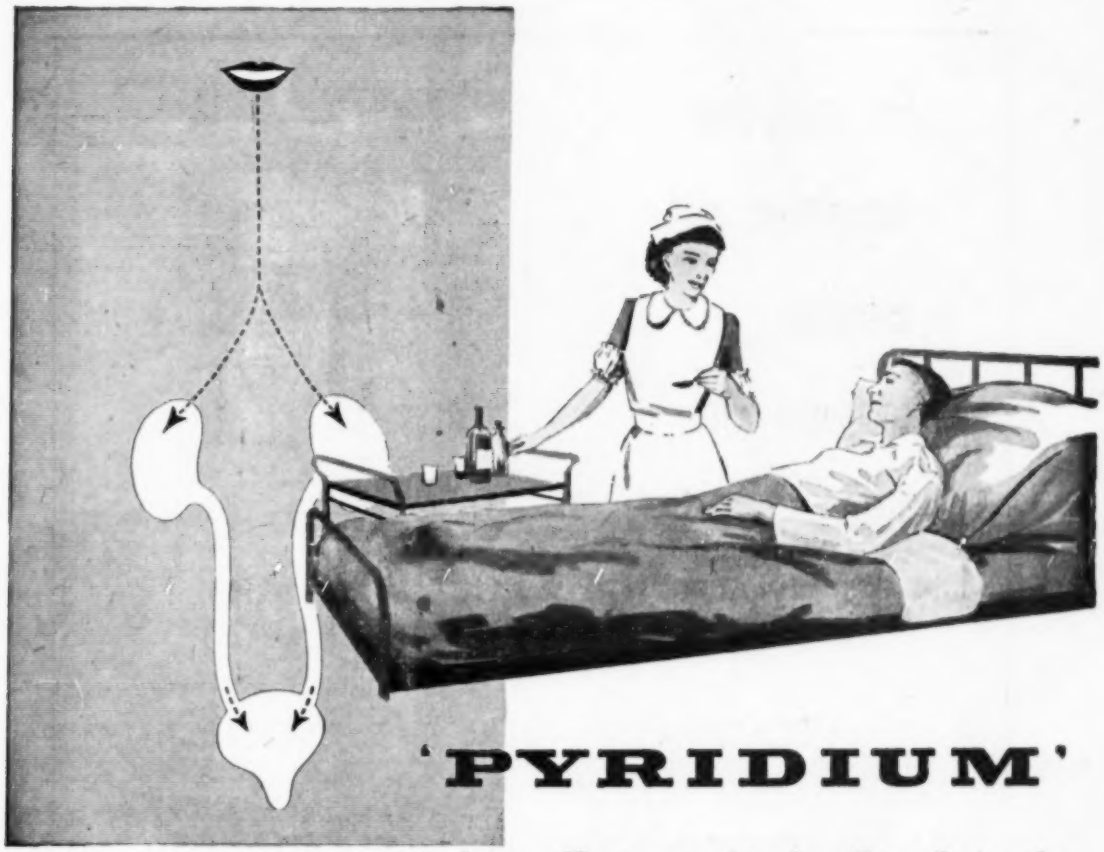

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TABLE I

Case No.	Name, Age & Sex	Symptoms: Abdominal Pain	Symptoms: Loose Stools	Symptoms: Others	Appetite: Increased	Appetite: Diminished	Appetite: No change	Stools: Vegetative	Stools: Cystic	Camoquin 0·2 g. tabs.	Untoward Reactions	Stools after administration of Camoquin: 1st exam. Vege.	1st exam. Cystic	2nd exam. Vege.	2nd exam. Cystic	3rd exam. Vege.	3rd exam. Cystic
1	A.K.D., 23, F.	+	Alternating with constipation	–	–	–	+	–	+ +	3 Stat	–	–	–	–	–	–	–
2	K.K.R., 28, M.	–	Occasional	–	–	–	+	–	+ +	3 Stat	–	–	–	–	–	–	–
3	J.R.B., 27, M.	+	+	Flatulence	–	–	+	+ +	+ + +	3 Stat	–	–	+	–	–	–	–
4	K.B., 18, F.	+	+	Acidity	–	–	+	–	+ +	3 Stat	–	–	+ +	–	–	–	–
5	R. S., 6½, F.	+	+	–	–	–	+	–	+ +	2 Stat	–	–	–	–	–	–	–
6	S.R., 2, M.	–	+	–	–	–	+	–	+ +	2 Stat	–	–	–	–	–	–	–
7	P.R., 8, F.	–	+	Emaciation, oedema legs	–	+	–	–	+ + +	2 Stat	–	–	–	–	–	–	–
8	M.R., 28, F.	–	Alternating with constipation	Flatulence	–	+	–	–	+ + +	3 Stat	–	–	–	–	–	–	–
9	D.C., 13, M.	+	+	Flatulence	–	+	–	–	+ +	2 Stat	–	–	–	–	–	–	–
10	G.P., 12, M.	–*	+	–	–	–	+	–	+ + +	2 Stat	–	–	–	–	–	–	–
11	A.K.G., 9, M.	Occasional	Occasional	–	–	–	+	–	+	2 Stat	–	–	–	–	–	–	–
12	P.K., 7, F.	+	+	–	–	+	–	–	+	1 Stat	–	–	4	–	–	–	–
13	N., 3, F.	–	+	–	–	–	+	–	+ +	1 Stat	–	–	–	–	–	–	–
14	J., 1, M.	+	+	–	–	–	+	+	+ + +	2 Stat	Sweating, lethargy, nausea, vomiting	–	–	–	–	–	–
15	M.C., 2, F.	–	+	–	+	–	–	–	+ +	2 Stat	Nausea, vomiting, anorexia	–	–	–	–	–	–
16	M., 2, M.	–	+	Fever-anaemia, retarded growth	–	+	–	+	+ + +	2 Stat	–	–	–	–	–	–	–
17	S.A., 1½, M.	+	+	–	–	–	+	–	+ +	1 Stat	Vomiting	+	+	+	+	–	–
										1 Stat*	Nausea, anorexia	–	+	–	–	–	–
18	A.B., 2, M.	–	+	–	–	–	+	–	+ + +	1 Stat	–	–	+	–	+	–	–
										1 Stat*	–	–	–	–	–	–	–
19	S., 3, M.	–	+	–	–	+	–	+ +	+ +	1 Stat	–	+	+	+	+	–	–
										2 Stat*	Lethargy, vomiting	–	–	–	–	–	–
20	B., 4 M.	–	+	–	+	–	–	+ +	+ +	1 Stat	–	+	+	+	+	–	–
										2 Stat*	Anorexia, lethargy vomiting	–	–	–	–	–	–
21	S.A., 1½, M.	–	+	–	–	–	+	+ +	+ +	1 Stat	–	+	+	+	+	–	–
										2 Stat*	Vomiting, lethargy	+	+	+	+	–	–
22	A.D., 6, F.	–	+	–	–	–	+	–	+ +	1 Stat	–	–	+	–	+	–	–
										1 Stat*	–	–	+	–	–	–	–
23	G.D., 14m., M.	–	+	–	–	–	+	+ +	+ +	1 Stat	Lethargy, sweating, vomiting	+	+	+	+	–	–
										1/3 T.I.D. for 2 days*	–	–	–	–	–	–	–
24	A.M., 1½, M.	–	+	–	–	+	–	–	+ +	1/3 T.I.D. for 2 days	–	–	–	–	–	–	–
25	C.H., 3, F.	–	+	–	+	–	–	+ +	+ +	1/3 T.I.D. for 2 days	–	–	–	–	–	–	–
26	K., 10m., M.	–	+	–	–	–	+	+ +	+ +	1/3 T.I.D. for 2 days	–	–	–	–	–	–	–
27	B.D., 14m., M.	–	+	–	–	–	+	+ +	+ +	1/3 T.I.D. for 2 days	–	–	–	–	–	–	–
28	K.C., 1½, M.	–	+	–	–	–	+	+ +	+ +	1/3 T.I.D. for 2 days	–	–	–	–	–	–	–

+ = Present; + + = Moderate numbers; + + + = Large numbers; – = Absent; m = Months; * = Second dose

febrile form of giardiasis found chloroquine sulphate effective in eradicating the infection and at the same time bringing down the temperature.

We used camoquin in 28 cases of giardiasis. Only those cases where the symptoms were due to infection by Giardia intestinalis alone were included in this investigation. Diagnosis in all cases was confirmed by examination of the faeces. After completion of treatment by camoquin the faeces were examined at least three times at an interval of four days, the last one after a dose of purgative. Magnesium sulphate was given to adults and mist. alba or milk of magnesia to children and infants. At the initial stage of the investigation the dose schedule was a stat dose of 3 tablets of 0·2 g. each for an adult, 2 tablets for patients between 5 and 15 years and 1 tablet for children below the age of 5 years. The patients swallowed the tablets with a draught of water after some food. In infants and young children the tablets were crushed and suspended in some water sweetened with sugar. In adults and adolescents the stat dose of 3 and 2 tablets respectively was quite effective and did not produce any toxic symptom. In children and infants the dose schedule was later changed, reasons being persistence of infection and manifestation of minor toxic symptoms.

Clinical features of the cases and the dose, untoward reactions and therapeutic effect of camoquin are stated in Table 1. The drug was repeated when the first two examinations of the stools after completion of therapy were still positive. In these cases the second course was given on an average of 8 days after the first one.

Discussion

Though mepačrine is almost a specific for giardiasis, the drug has to be continued for 5 to 7 days and it may produce toxic symptoms. Camoquin was used in 28 cases of giardiasis. Faeces of all the cases except one were freed of the parasite and the symptoms were relieved. In adults and adolescents one "shot" treatment with 3 and 2 tablets respectively was effective and did not produce any toxic symptom. Some of the infants and young children who had stat doses of one or two tablets of camoquin showed toxic symptoms like nausea, vomiting, anorexia, sweating and lethargy. These symptoms were more common when 2 tablets were given at a time. On the other hand one "shot" treatment with one tablet was not effective in several cases. In infants and young children a better dose schedule was 1/3 tablet (66 mg.) three times daily for two days in succession. With this dosage, there were no toxic symptoms and the stools were free from the parasite in all cases. There was improvement in the appearance and reduction in the number of stools within two days of the therapy. This changed the psychology of the mother greatly.

Summary

Camoquin was used in 28 cases of giardiasis. The stools were freed of the parasite in all cases except one and the patients were relieved of the symptoms.

In adults and adolescents one "shot" treatment with 3 and 2 tablets of 0·2 g. each respectively was effective and did not produce any untoward reaction.

In infants and young children the dose suggested is 1/3 tablet (66 mg.) three times daily for two days.

The drug in all cases should be given after food.

Acknowledgment

We are grateful to Dr. A. K. Dutta Gupta, Principal-cum-Superintendent, Nilratan Sircar Medical College, for the permission to carry out this investigation. Our thanks are also due to Drs. N. Pal and B. Sen Gupta for their valuable help in the investigation and to Messrs. Parke, Davis and Company for their generous supply of camoquin.

References

De'Muro, P.—*Acta Med. Scandinavia*, **102**: 17, 1939.
Hartman, H. R. and Kyser, F. A.—*J.A.M.A.*, **116**: 2835, 1941.
Martin, P.—*Rev. Med. d. Hyg. Trop.*, **29**: 33, 1937.
Mein, R. M.—*Am. J. Trop. Med.*, **31**: 212, 1951.
Muller, B., Annino, R. and Garnier, P.—*Archives des Maladies de l'Apparcil Digestif.*, **41**: 763, 1952.
Soberon Y Parra, G. and Pela'ez., D.—*Trop. Dis. Bull* **47**: 380, 1950.

PRACTITIONERS' CORNER

MANAGEMENT OF RHEUMATIC HEART DISEASE*

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Introduction

At the very outset, before presenting a detailed discussion of the management, it is important to emphasize that there is no specific therapy of proven value. The prevention of rheumatic heart disease and of its ultimate progression to a chronic invalid state is probably more of a socio-economic problem than a medical one. Let us not, therefore, be too dogmatic in the execution of the recommended therapeutic measures.

Measures for the Active Phase

A. Salicylate Therapy: It is a well recognised fact that salicylates or aspirin in full dosage produce a striking relief of pain, swelling of joints and fever in acute rheumatic infection; and this effect is said to be almost specific. But by gene-

*Based on a paper read in the R. G. Kar Medical College Reunion, 1952.

ral consent, it is regarded as without action on the course and progress of rheumatic carditis. However, the evidence that salicylates inhibit the spreading effect of hyaluronidase has suggested a more specific action on the rheumatic process. And this is quite in agreement with the views of Coburn who considers that a blood concentration of 35 mg. of salicylate per 100 ml. or more can rapidly suppress the infection and/or prevent the cardiac lesions, if treatment is instituted early. But such claims have not been supported by others. Any way, as rapid subsidence of large pericardial effusion in rheumatic patients has occurred on several occasions following adequate salicylate therapy, it is highly probable that salicylates control the exudative phase of cardiac inflammation, but not the proliferating nodules.

Whatever may be the views about the value of salicylate therapy there is no doubt that indirectly it exerts a profound beneficial effect by controlling fever, tachycardia, pain and insomnia. It would be cruel, therefore, not to use the drug, more particularly so when it appears to exert no deleterious effect on the myocardium.

To be effective the drug is to be pushed to the extent of mild salicylate intoxication. Many so-called resistant cases are really due to underdosage or to excessive use of sodium bicarbonate. The older teaching was that, to reduce the toxic effects sodium salicylate should be prescribed with the same or even double the dose of sodium bicarbonate. It has now been shown, however, that the only effect of alkali is to increase the excretion of the drug. Consequently the desired therapeutic response can only be obtained with larger amounts of salicylates than if given alone. Moreover there is no proven virtue in any of the special salicylate preparations so commonly recommended except in cases of impending heart failure, where sodium salt in any form is contraindicated, because of its water retaining property.

Dosage—20 grains of sodium salicylate or 15 grains of aspirin to a child of ten, and 30 grains of salicylate or 24 grains of aspirin to an adult should be given every 4 hours, day and night, preferably after meals. Sodium bicarbonate, if given at all, should be half the amount of salicylate or even less. Salicylates are to be pushed till mild toxic effects as tinnitus and deafness appear. These are practically unavoidable and can be ignored. But more serious toxic symptoms such as vomiting, drowsiness and deep respirations, call for immediate stoppage of the drug for 24 hours; and administration of sodium bicarbonate, if necessary. The most serious complication, however, is the development of a haemorrhagic state due to hypoprothrombinaemia; but the danger of salicylate induced haemorrhage during ordinary salicylate therapy is insignificant. Any way, if haemorrhagic symptoms appear, the drug is to be discontinued altogether. Vitamin K. 20 mg. in aqueous solution intravenously is to be injected 3 times daily or better still a transfusion of 500 ml. of fresh blood.

Duration of therapy—After the acute phase is over, salicylates should be continued as long as the rheumatic process remains active, in doses just sufficient to keep pain and fever in abeyance. This is about 30-60 grains for a child and 45-90 grains for an adult daily. Should there be a recurrence, the dose is to be temporarily increased.

Route of administration—For all practical purposes it is oral, as the parenteral one is associated with frequent toxic effects. Rectally in doses of 45 to 60 grains in 150 to 200 c.c. of starch water 3 or 4 times a day may be given in cases where frequent vomiting from local effect precludes oral administration.

Adjuvants—Simultaneous administration of para-amino benzoic acid (P.A.B.A.) 30 grs. each time with salicylate increases the blood salicylate level in obstinate cases.

Substitutes—(a) Amidopyrin: It is very effective in salicylate resistant cases. Total daily dose is 25 to 30 grains for a child and 30 to 45 grains for an adult, given in 4-5 divided doses. But the danger of agranulocytosis restricts its use in general.

(b) Such newer drugs as sodium gentisate, 8-12 g., Hydroxy-phenyl cinchonininic acid 20-40 mg./kg. bodyweight are nowadays giving promisingly good results. However, more trials are necessary before final opinion can be given.

B. ACTH AND CORTISONE: Both exogenous cortisone as supplied from outside and the endogenous one as liberated from the stimulation of adrenal cortex by the adrenocorticotrophic hormone of the anterior pituitary, ACTH, (as it is briefly called) cause remarkably rapid subsidence of fever, joint pains and all signs of rheumatic carditis; and thus considerably cut short the clinical course of the disease. May and Wilson believe that these steroid hormones, given sufficiently early before there is irreversible damage can cause complete cessation of all rheumatic activities. But the opinion is seriously divided on this point. Most of the workers consider that the best results are obtained in primary cases or in early relapse; and it is exudative lesions that are easily controlled, whereas proliferative ones such as rheumatic nodules may even appear despite hormone therapy. Moreover, in all cases, irrespective of the duration of therapy the rheumatic process remains suppressed as long as the drug is used. And the disease, if not spontaneously regressed manifests itself, sometimes with renewed vigour almost immediately after withdrawal of the drug. This relapse, however, is easily controlled by reinstitution of the therapy in most cases. But continued administration of ACTH is fraught with the dangers of many serious undesirable results such as Cushing's syndrome, hyperglycaemia and glycosuria, disordered mental and sexual functions and not the least important is the

depletion of potassium and retention of salt and water which ultimately precipitates heart failure. Hench has very aptly compared the effect of the hormone therapy in rheumatic infection to 'clothing a fire-man in the middle of a fire with an asbestos suit; it may prevent him from being burnt, but it will not put out the fire.'

Dose—As the response varies considerably in different individuals the smallest effective dose should be found out by trial and error. The dose depends more on the severity of the process than on the age, sex, etc., of the individual.

To start with ACTH 10 to 15 mg. intramuscularly every 6 hours is recommended; if this is insufficient, 15 to 20 mg. every 4 hours generally serve the purpose. With Cortisone the requirement is about 200 to 400 mg. daily. It is equally effective when administered either orally or parenterally. The total dose is to be divided, if administered orally, as the rate of excretion is much quicker, when given by this route; whereas the desired therapeutic response may be obtained with a single intramuscular injection given every 24 hours.

Duration of therapy—When the acuteness of the process is controlled the dose of Cortisone is to be reduced to 100 mg. or less per day and in case of ACTH to 20 to 40 mg. per day. And just to bypass early recrudescences the hormone therapy should be continued for 4 to 8 weeks at least, if not more.

Comparative value—Except in cases resistant to salicylates or where early toxicity develops due to the individual's susceptibility, hormones have got no special advantage; for, there is no conclusive evidence that hormone therapy is in any way better than salicylates in reducing the cardiac inflammations. Moreover, recent biochemical studies strongly suggest that salicylates also act by endogenous liberation of ACTH.

C. CHEMOTHERAPY AND ANTIHISTAMINIC DRUGS: Neither sulphonamides nor penicillin is beneficial in the treatment of rheumatic carditis, sulpha drugs may indeed be harmful. Antihistaminic drugs on the basis of allergic concept of the disease also have been given trials, but with no palpable effect on any of the rheumatic manifestations. However, to control secondary infections, if there be any, antibiotics are indicated as in all other diseases.

D. DIET: This should be limited to fluids only during moderate or high pyrexia. After the first week, a high caloric but easily assimilable diet is indicated. Proteins in the form of milk and egg should be supplied as most of the patients are growing ill-nourished children. Various vitamins, especially vitamin C are to be given in concentrated forms. Low salt diet is, however, indicated during hormone therapy and/or impending heart failure. On the other hand, it is to be emphasized that plenty of fluids, provided salts are restricted, are indicated, as they help much in promoting diuresis, even when congestive cardiac failure has supervened.

E. REST AND GENERAL MEASURES: Although many cases may proceed relentlessly inspite of bed rest, still *absolute confinement to bed is the most vital element of the treatment of the active stage of the disease.* The patient is to be helped in every affair, he should not be allowed to do anything for himself so long active carditis persists. Complete rest no longer means horizontal rest with or without pillows. The amount and degree of rest obtained by lying in bed varies a good deal from individual to individual. The whole point is that the patient should be nursed in the most comfortable and restful position possible for the individual, may be this in bed or even in an easy-chair. And this should also include pleasant surroundings and facilities for diversion, if possible.

Good refreshing sleep is a necessity, as this alone can appreciably shorten the time spent in confinement to bed. Any one of the barbiturates, chloral and bromides generally serve the purpose.

Cathartics or enemata may be necessary while the patient is in bed. Cascara or milk of magnesia are usually satisfactory.

Treatment of anaemia with suitable iron preparations can be postponed till early convalescence.

Duration of rest—Rest should be continued for weeks and in severe cases for months until all evidences of active rheumatic infection have disappeared. The situation, therefore, is much the same as in tuberculosis in this respect as it is impossible to predict the duration of activity in either disease.

Signs of activity—Presence of activity are to be looked for carefully in every case. Besides the classical ones such as, pain and swelling of joints, fever tachycardia, subcutaneous nodules, sore throat, chorea, etc., failure to gain in weight and/or of improvement of anaemia inspite of all other measures are nowadays considered to be very valuable evidences of activity of the disease. And to be definite about the cessation of activity, one should wait till the erythrocyte sedimentation rate (E.S.R.) comes down to normal and the 'Koagulation band' (K.B.) shifts to the right in Weltmann reaction (of the serum).

Rest is a sovereign measure no doubt, but it is a culpable error to prolong the period after cessation of all activities which heralds convalescence. It may be mentioned in this connection that salicylates or other antipyretics often mask the signs of rheumatic activity, hence patients are to be kept under observation for 2 weeks at least after withdrawal of the drug, before allowing physical activities. Just on the other hand there may be cases with persistent tachycardia without any other evidence of activity; this disappears completely with graduated exercise.

While in convalescence, gradual return to work is imperative in most cases except in those grossly crippled by the disease. Because, prolonged inactivity results in considerable atrophy of the skeletal muscula-

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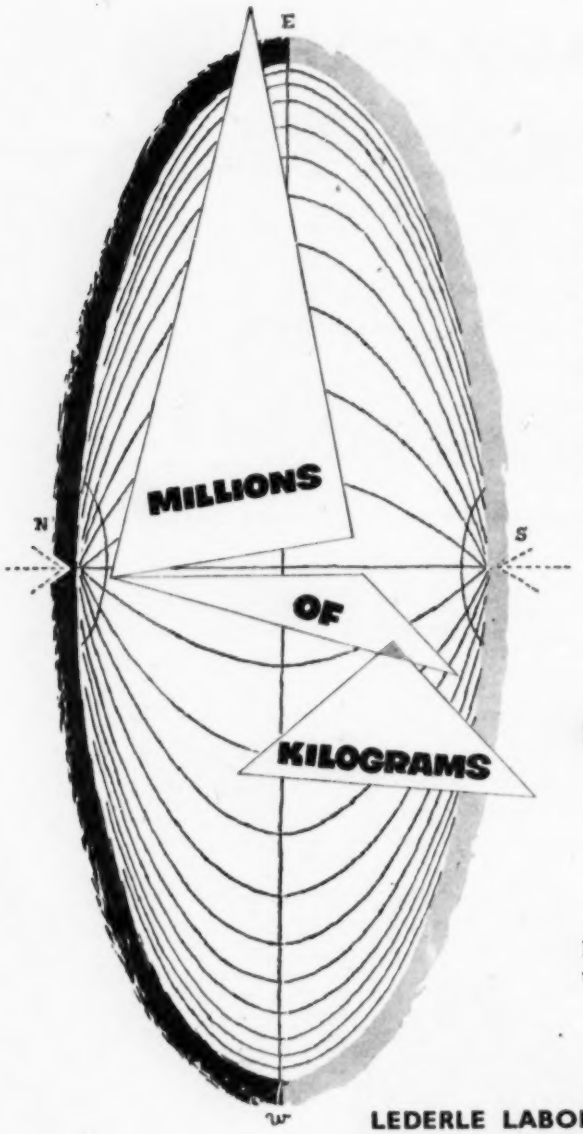

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ture and there is a strict parallelism between the status of the skeletal muscles and the state of myocardium; thus an athlete possesses a stronger and heavier heart than the average person. And it is to be emphasized, that *like every other muscle the heart must also do its full share of work in order to retain complete functional capacity*. Moreover, there is no evidence that limitation of physical activity can protect against additional attacks and consequent further progression of the disease; on the contrary, it has been found that graduated moderate exercise is beneficial for the subject of early valvular disease.

Since the convalescence is prolonged for 6-18 months as the case may be, the question of education in children raises a serious problem. Such physical handicaps as produced by the disease should by no means stand in the way of proper education, because in the struggle for existence they will have to compete with others in the usual way. Better education means better ability to secure a sedentary occupation which causes minimal cardiac strain. Whereas average or no schooling will drive these to take up unskilled labour and thereby precipitate early decompensation. Construction of hospital school and convalescent home, therefore for these children and adults is imperative.

Furthermore, social and economic factors, as pointed out at the very outset, play a vital role in guiding the ultimate prognosis of these cases. Patients who are financially well off can reap the benefit of prolonged rest or are in a position to take up a suitable occupation as the cardiac condition permits. Whereas the common man, manual labourers, who are economically hard pressed, can afford rest only at the cost of the family's health or they are forced to jeopardize their own by premature resumption of physical activities. And such problems can to a great extent be eased by the construction of centres for occupational therapy preferably inside or outside the convalescent home. Such centres will provide light works for these crippled individuals. Woolwork, leatherwork, radio-mechanics, watch making, precision instrument making and the like all are remunerative and make little call on one's physical strength. And such an occupation can very well maintain their interest and independence.

Management During the Inactive Phase

In the large majority of such cases no treatment is generally necessary. However, all rheumatic subjects should be under continued observation, especially for early recognition of relapse which is unfortunately a frequent feature. Relapse calls for re-institution of the rest regime as each of these reactivations means adding fresh insult to the injury. In no other disease, is co-operation between the patient, his family and the physician so essential; and a balanced judgment is so often necessary to guide to avoid excessive fatigue on the one hand, and development of cardiac neurosis on the other.

Guidance—Cases with mitral lesion with little or no cardiac enlargement need no special treatment or restriction. But they should try to live within the limits of their cardiac reserve. That is they should not indulge in such work as is liable to cause frequent exhaustion or frequent extraneous infections, especially of the respiratory tract. On the other hand, in patients with obvious cardiac enlargement, or with dyspnoea on moderate exertion, school in children and sedentary occupation in adults should be permitted, but not the out-door games and sports. However, occupational therapy preferably in the convalescent home is all that can be allowed for the grossly crippled ones.

Marriage, etc.—Question of marriage is often a serious dilemma with most rheumatic subjects and each individual has a special problem of its own. No definite answer can be given in a discourse like this. In general it may be mentioned that no one should marry who does not possess a good financial as well as cardiac reserve. Likewise, childbearing is totally contraindicated in married women with poor cardiac reserve. Whereas most women with compensated heart lesions are able to bear one or more children without serious consequences, provided due care is taken in spacing and during the entire period of gestation and confinement.

Surgical Measures

With the advancement of modern surgery, mitral valvulotomy has been successfully done on properly selected cases of mitral stenosis, with astonishingly good results. To relieve the constrictive pericarditis, pericardectomy is now being done with promising results.

Management of the Common Complications

A. Heart Failure: When it complicates active rheumatic carditis, it becomes one of the most serious conditions and most difficult to manage. Mild cases may respond to digitalis, but in more severe ones myocardial damage is far too advanced to respond to the chemical stimulus exerted by the aglucones. Moreover, because of the sinus tachycardia from active carditis toxicity from overdosage frequently occurs, as it is often difficult to assess the therapeutic limit clinically. Although digitalis is a dangerous agent in rheumatic pancarditis, for cases of heart failure complicating quiescent phase of the disease, this is one of the best drugs that we possess in our therapeutic armamentarium. It is of little or no consequence, whether the failure is mild or severe, right or left ventricular in origin, whether blood pressure is high or low, cardiac rhythm regular or irregular, whether aortic regurgitation, heart block (apart from digitalis) is present or not and last but not the least important whether the heart rate is slow or rapid. *In any case the primary and the most important indication for the administration of digitalis is congestive cardiac failure*. But the

improvement of cardiac function by the drug solely depends on the myocardial reserve. In badly damaged hearts, therefore, digitalisation may not produce the desired therapeutic response.

Routes of administration and time of action—Digitalis should preferably be given orally and after meals to lessen the gastric irritation. It takes about 6 hours to produce the maximum effect. Given intravenously action begins in 1 hour, the maximum being reached in 4 hours, as some time must be allowed for the aglucone to become fixed to the myocardium. Hence, for emergency purpose Ouabain is more suitable than any of the digitalis preparations being fully active in half-an-hour's time.

Subcutaneous and intramuscular injections are associated with considerable pain and reactions; as absorption is uncertain, these routes are, therefore not advocated in general.

Rectally, it is equally effective and may be given when vomiting from local action precludes oral administration. Preliminary cleansing enema is a necessity and the drug is to be suitably diluted to avoid local irritation.

Preparations and dosage—The different digitalis and their allied preparations with their doses and relative merits are discussed briefly in Table 1.

Digitalisation—The drug ought to be pushed till full digitalisation occurs or mild toxic symptoms appear. Clinically the former (state) is recognised by the relief of symptoms and signs of failure. And this is a better guide than the pulse or the ventricular rate especially in cases with initial bradycardia, because, slowing of the rate occurs only when tachycardia complicates heart failure.

Digitalisation can be done by the rapid method of Eggleston by giving half the total requirement in the 1st hour; and the rest in divided doses within 18-24 hours starting 6 hours later. To avoid undesirable toxic effects, it is more preferable, if the condition of the patient permits to digitalise the patient more slowly by evenly distributing the calculated dose in course of 3 or 4 days. Once digitalised, the dose should be reduced and a small subsidiary dose, the so-called maintenance dose be given to prolong the therapeutic effect.

The calculation for the dose is based on oedema-free body weight; and the average digitalising and maintenance doses for the respective preparations are mentioned in the table provided. It is important to emphasize that the digitalising as well as the maintenance dose is not a fixed quantity, but varies from patient to patient, and even in the same patient at different times. The dose proper can, therefore, be only found out by trial and error for the particular occasion in an individual case.

It may be mentioned in this connection that it is better to be thoroughly familiar with one particular potent preparation only and always stick to it rather than make frequent changes for newer preparations from time to time. For, the dose and the rate of digitalisation can then be well anticipated in most cases, from the experiences (with the drug) gained in the past.

Contraindications—Contraindications for the administration of digitalis are only few such as—(a) rheumatic pancarditis, (b) paroxysmal ventricular tachycardia, (c) cases taking digitalis in the recent past (within 3 weeks of full digitalisation); electrocardiograms may be necessary to detect the latent digitalis effect, if the drug is to be re-administered to such patients.

Digitalis combined with other drugs—When digitalis is being taken, it is dangerous to use any of the following drugs—(a) adrenaline, (b) ephedrine, (c) calcium salts, (d) strophanthin.

Clinical toxicity of digitalis—Careful supervision is often necessary to detect early toxic manifestations such as—(a) nausea, (b) vomiting, (c) dizziness, (d) slowing of pulse, (e) extra systole, etc.

Late toxic manifestations are varied and can be grouped as follows—(a) gastro-intestinal—frequent vomiting, diarrhoea; (b) circulatory—coupled rhythm, partial and complete heart block, multiple and multifocal extra systole, rise of blood pressure, fall in cardiac as also urinary output, reappearance or increase of oedema; (c) neurological—headache, muscular weakness, depression, mental confusion, delirium, green vision and scotoma, (a) allergic—urticarial rashes, asthma, angioneurotic oedema (all these are extremely rare).

Adjuvants to therapy—(i) Mercurial diuretics—The response to these drugs in heart failure is often so dramatic that this can very well be regarded as the greatest advance in the management of the condition since Withering's discovery of digitalis in 1785.

Administration—Commonly employed as an intramuscular injection which is the safest; pain of injections can be greatly minimised by adding 0·2—0·3 c.c. of 2 per cent procaine solution to the injection. Intravenously occasionally it has been followed by rapid death; whereas orally and rectally they are less effective and liable to cause much local irritation. The effect of injection generally starts in 2 hours, maximum reached in 8-12 hours, hence to be given in the morning.

Dose and duration—Starting dose is 0·5 c.c.; increasing to 1-2 c.c., may be given daily or an alternate days; and later on once or twice a week as the situation demands.

Dangers—(a) Over-digitalisation from increase in concentration of the drug in the tissue fluid due to prolonged diuresis, particularly seen in the later part of digitalis therapy.

(b) Dehydration, depletion of sodium and rise of potassium from excessive diuresis.

(c) Mercurial poisoning.

TABLE 1—SHOWING THE DIFFERENT DIGITALIS PREPARATIONS, THEIR DOSES AND MERITS

Name of the Preparation	*Available as*	*Digitalising dose*	*Maintenance dose (Oral)*	*Remarks*
Digitalis pulverata (B.P.)	(a) Pill (b) Tablet (c) Capsule (d) Suppository	0·1 g./10 lb. of of body weight (Total 1-2 gm. on average)	0·1-0·2 g. per day	Loss of potency minimal, hence best of the cheaper preparations
Tincture digitalis (B.P.)	As such	1 c.c./10 lb. of body weight (Total 10-20 c.c. on average)	1-2 c.c. per day	More liable to undergo deterioration, especially when served in the mixture; hence more likely to cause gastric irritation
Digitoxin (B.P.) 'Digitaline nativelle', 'Crystodigin' (Lilly)	(a) Tablets—each 0·1 & 0·2 mg. (b) Amp.—0·2 mg. per c.c.	1-1·8 mg. (either orally or I.V.*)	1·1-0·2 mg. per day	1000 times as powerful as crude drug. Oral absorption complete, but rate of excretion very slow taking 2 weeks at least; hence toxic effects likely to be prolonged
Digoxin (B.P.)	(a) Tablets—each 0·25 mg. (b) Amp.—0·5 mg. per c.c.	2·5-5 mg. 1-1·5 mg. (I.V.*)	0·5-0·75 mg. per day	Found in D. lanata only. As oral absorption incomplete, larger doses required than when given by injection, quickly excreted almost completely in 48 hours hence toxicity less and brief but maintenance of drug effect difficult
'Lanatoside-C' 'Cedilanid' (Sandoz)	(a) Tablets—each 0·25 mg. (b) Liquid—1 mg. per c.c. (c) Amp.—0·2 mg. per c.c.—2 and 4 c.c.	5-7·5 mg. 1·6 mg. (I.V.*)	0·5-1·5 mg. per day	
Ouabain (from S. gratus) Strophanthin (from S. kombé)	(a) Amp.—0·25 mg. and 0·5 mg. per c.c. (b) Amp.—0·25, 0·34, 0·5 and 0·65 mg. per c.c.	0·8-1 mg. (I.V.*) Starting with 0·25-0·5 mg. supplementing 0·1 mg. every hour till the desired effect produced	Not used as such; but some digitalis preparation given simultaneously to prolong the effect	The drug for emergency use. Not effective orally; I. V. action in 10 mins., max. in 1/2-1 hour. Excretion complete in 24-36 hours, hence maintenance of drug effect difficult. Ouabain preferred to Strophanthin, because the potency of the latter sometimes variable
'Scillaren' (Sandoz)	(a) Tablet—each 0·8 mg. (b) Liquid—0·8 mg. per c.c.	9-14 mg.	1·6-3·2 mg. per day	Drug action rapid but less persistent, relatively more potent in vagal, less potent in muscular effect, hence not a good substitute for digitalis. A good diuretic by direct effect on the kidneys; orally impure products are powerful gastric irritants.
'Scillaren-B' (Sandoz)	(a) Amp.—0·5 mg. per c.c.	Not to exceed 0·5 mg. in 24 hours (I.V.*)		
'Urginin' (Lederle)	(a) Tablet—each —1 mg.	4-6 mg.	0·5-1 mg. per day	

*It is extremely dangerous to use any of the parenteral preparations within 2-3 weeks of previous digitalisation, without electrocardiographic control; one should be very definite, therefore, before administering them. Moreover, as they are local irritants, they should be diluted 10-20 times with normal saline or glucose before being injected into the veins and injections are to be given very slowly.

(ii) Venesection—It is rarely necessary nowadays, but it is often a life saving measure in acute forms of right or left ventricular failure; and also helpful in cases where both arterial and venous pressures are considerably raised. It is, however contraindicated in cases of anaemia or low arterial blood pressure. Not less than 100 and usually not more than 600 c.c. of blood should be let out in a sitting.

(iii) Paracentesis—abdominis or thoracis, and/or subcutaneous application of Southey's tubes are occasionally necessary to control oedema in obstinate cases.

B. AURICULAR FIBRILLATION AND FLUTTER—When these complications develop during the active phase of the disease, prognosis is grave and nothing palpable can be done. During the quiescent phase auricular fibrillation and flutter by themselves do not require any treatment unless heart failure, a very common complication supervenes. And for this (complication) digitalis is the drug as stated already. It should be noted that although digitalis through the production of heart block can effectively control the failure by sparing the ventricle, from the innumerable disordered stimuli originating in the auricle, it cannot correct the altered rhythm for which quinidine, procainamides, etc., are the drugs of choice. However, these quinidine group of drugs have limited scope, being indicated only when fibrillation or flutter is

acute in onset or coming on paroxysmally in rheumatic subjects with minimal lesions. Whereas in old persistent cases with enlarged heart and/or established lesions they are totally contraindicated.

Moreover it is to be emphasized that these drugs are not uniformly effective in correcting the altered rhythm even when administered to properly selected cases. The secret of success lies in the relative degree of affection of the conduction time and the refractory period. The circus movement will stop if the refractory period is more affected than the conduction time. Whereas the reverse that is perpetuation of the altered rhythm will occur if the conduction time is more depressed than the irritability of the auricular musculature.

Administration and dosage—Quinidine is effective when given either orally or parenterally. Oral one is the route of choice, for parenteral administration requires careful electrocardiographic control.

The patient should be in bed and preferably in hospital and constant supervision is necessary. Digitalisation prior to quinidine therapy often helps in controlling tachycardia that may suddenly develop due to conversion of the auricular fibrillation into flutter from depression of the auricular musculature. A test dose of 0·1 to 0·2 g. should always be given to detect the presence of idiosyncrasy. If nothing untoward happens, next day quinidine, 0·4 g. every 3-4 hours five times daily is to be given for 7-10 days. This constitutes a course and if necessary a second or third course may be repeated 2-3 weeks after. When the altered rhythm is controlled, (which is more likely to be in cases of fibrillation than flutter) the dose should be gradually reduced to a maintenance one of 0·2-0·4 g. or more per day. To prevent recurrence this should be continued for a good length of time; and if it recurs reinstitution of the therapy in full scale is called for.

When to stop—One discontinues quinidine, if found ineffective even after several attempts, or if toxic symptoms appear. Tachycardia over 125, obstinate auricular flutter, premature ventricular systole, petechial rashes—all these also call for immediate stoppage of the drug.

Dangers—(1) Embolism due to dislodgment of thrombi from the auricle by the resumption of effective auricular contractions.

(2) Ventricular standstill due to simultaneous depression of the pacemaker of the heart (situated in the auricle).

(3) Dangerous tachycardia from sudden conversion of the fibrillation to flutter (auricular).

(4) Ventricular fibrillation.

Prophylaxis

The object of prophylaxis is to eliminate recurrent rheumatic infection. Measures for the improvement of general health such as, proper nutrition, adequate rest, healthy living conditions and the like are, therefore necessary to increase the body resistance and thereby minimise the chance of rheumatic infection getting a foothold. Removal of the septic foci, diseased tonsils etc. becomes at times imperative in order to lessen the incidence of recurrences, but routine operations are not at all helpful.

Chemoprophylaxis—To control haemolytic streptococcal infection particularly of the throat, chemoprophylaxis with sulpha drugs was first instituted in 1339. The results uptodate have not been sufficiently impressive, considering the risks of agranulocytosis and development of resistant strains. However, as oral administration of penicillin in 1 million units per day has produced very good results in some quarters, this is worth trying during the monsoon and winter in our country.

References

Beckman, H.—Treatment in General Practice, 6th Ed.
Brit. M. J.—2: 142, 582, 1952.
Dispensatory of the U.S.A., 24th Ed.
Dunlop, D. M., Davidson, L. S. P. and McNee, J. W.—Treatment in General Practice, 5th Ed.
Friedberg, C. K.—Diseases of the Heart.

SPECIAL ARTICLE

CORTICOMEDULLARY DIVERSION AND ITS POSSIBILE ROLE IN ACUTE RENAL FAILURE

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In papers on renal pathology under various surgical, medical and obstetrical conditions, gross cortical pallor with medullary congestion of the cut surface of the kidney has often been described and depicted (Bywaters and Dible, 1942; De and Chatterjee, 1935; Lucke, 1946). But because of the diverse disorders which were associated with this peculiar appearance, little significance was attached to it until Maegraith and Findlay (1944) ascribed it to the possible occurrence of diversion of the cortical blood to the medulla in course of their study of the blackwater fever kidney. These authors, however, did not elucidate the mechanism, assess its significance or define the exact pathway for the redistribution of blood within the kidney and chiefly emphasized the existence of a 'vascular atonic collapse'. Trueta (1945) commenting on a subsequent paper by Maegraith and his co-workers (1945) ascribed the interference with renal blood flow to a persistent arterial spasm which had been demonstrated experimentally to accompany a state of shock (Trueta and Barnes, 1942). The role of renal vasospasm in the reduction of renal blood flow

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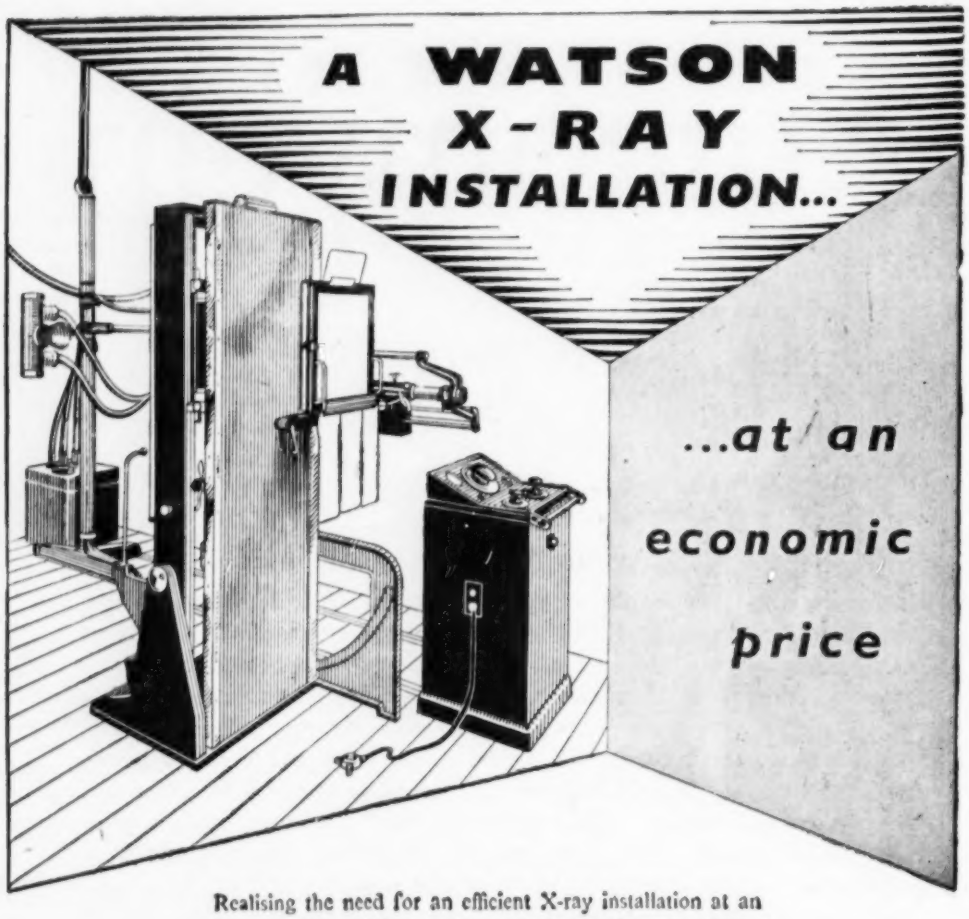

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and production of renal anoxia was noted but its possible relation to the suggested intrarenal redistribution of blood was not recognised either by Trueta (1945) or by Maegraith and Havard (1946).

Observations on Animal Experiments

Trueta and his co-workers (1946) published a preliminary report of their study of the rabbit kidney by angiography and by intra-arterial injection of dye after electrical stimulation of the central end of severed sciatic nerve and of the renal nerves. The mechanism and the possible effects of the observed corticomedullary diversion of blood were briefly considered. In the more detailed investigations (Trueta *et al*, 1947) the Oxford workers recorded similar and more exact evidences of intrarenal redistribution of blood after stimulation of various nerves, injections of various drugs and of staphylococcus toxin, induction of rapid haemorrhage and application of tourniquet to the hind limb. Gross and microscopic examination after injection of methylene blue, Indian ink, and after preparation of neoprene latex casts and angiographic and radiomicrographic methods were used in their studies. They thought the diversion to be the effect of cortical vasospasm the role of which was also recognised by Maegraith (1948) in his subsequent monograph. Goodwin and his co-workers (1949) made an exhaustive study of the phenomenon by experiments on rabbits, dogs, cats and monkeys. They used direct and indirect methods of stimulation of various nerves and obtained the best positive results with that of the plexus around renal arteries. The state of the renal circulation was estimated by direct visual observation of blanching of the kidney surface, by intra-arterial and intravenous injection of dyes and by preparing serial films after injection of thorotrast. They found evidence of cortical ischaemia with maintenance of juxtamedullary and medullary circulation. Arcadi and Farman (1949) induced dehydration in rabbits by severe catharsis and injected Indian ink suspension into the ear vein. The gross and microscopic appearance of the kidneys suggested a major diversion of arterial blood into the medullary circulation. Montague and Wilson (1949) also found evidence of shunting of blood through juxtamedullary glomeruli by the use of thorotrast medium after intravenous injection of 0·1 mg./kg. epinephrine in rabbits. Franklin *et al* (1949) demonstrated the occurrence of corticomedullary diversion by injection of Indian ink suspension into the aorta after the induction of asphyxia in rabbits by tracheal compression and by administration of carbon monoxide. The writer (De *et al*, 1950, 1951) using Pickworth's stain for blood vessels obtained histological evidence of corticomedullary diversion of blood after intraperitoneal injection of a suspension of killed cholera vibrios in rabbits. Hoff *et al* (1951) obtained cortical ischaemia with deep engorgement of the medulla and juxtamedullary area by electrical stimulation of the region of the anterior sigmoid gyrus of the brain in cats. They used ultraviolet illumination following intravenous injection of fluorescein and also intra-arterial injection of Indian ink for demonstration of the redistribution of blood within the kidney. Black and Saunders (1949) using faradic stimulation of the sciatic nerve in the thigh of rabbits and cats for 10-20 minutes found marked lowering of PAH and inulin clearances in some of the animals. They thought these results might correspond to the presence of the 'Oxford shunt' but they could not be sure of it. Daniel *et al* (1952) using the techniques of Trueta *et al* (1947) obtained evidence of diversion in cats, dogs, rabbits, sheep and monkeys especially by rapid serial angiography. Cort and Barron (1948) have traced the reflex path for the phenomenon of shunting in cats and rabbits from the spinal afferents through the spinal cord. The details of the techniques have not been mentioned in the short report published.

While these are the more important experimental data which have accumulated in support of the concept of corticomedullary diversion, a number of workers have been unable to repeat a lot of the Oxford work and this appears to have threatened the very foundations of the latter. Maluf (1949) using renal clearance methods after intravenous introduction of lysed red blood cells in dogs could not find evidence of the occurrence of corticomedullary diversion. Study and Shipley (1949) obtained evidence of diffuse renal ischaemia with no juxtamedullary preponderance of dye injected intra-arterially. They employed electrical stimulation of the renal nerves in dogs. Draper and Whitehead (1949) during their study of the effects of diffusion respiration failed to obtain clear cut histological evidence of a renal blood shunt in the dog after intravenous injection of mercuric sulphide. Dole *et al* (1946) obtained uniform staining of the kidney substance by ink injected into the renal artery in dogs under haemorrhagic shock. Moyer *et al* (1950) tried the effect of injection of adrenaline and of sciatic nerve stimulation on the kidneys of rabbits and dogs. They injected ink suspension into the heart, abdominal aorta or into the renal artery and studied the distribution of ink under the experimental conditions. They could not find evidence of medullary diversion in the dog after any of the procedures or in the rabbit after sciatic nerve stimulation. But evidence of the 'Trueta phenomenon' was obtained in rabbits after adrenaline and also in rabbits receiving no adrenaline but dying of some other conditions. The cause of death in case of the kidney illustrated from the last group of animals was accidental haemorrhage which might have induced the diversion as in case of the Oxford workers. Kahn *et al* (1950) observed renal ischaemia not confined to the cortex after sciatic nerve stimulation and epinephrine injection in rabbits but no evidence of juxtamedullary diversion could be seen either in these experiments or when some other drugs were used. They injected Indian ink suspension into the abdominal aorta to study the distribution of dye inside the kidney. Schlegel

and Moses (1950) employed crushing injury and reinforced it with adrenaline in rabbits. They noted cortical ischaemia estimated by the distribution of a fluorescent dye injected intravenously but could not find evidence of juxtamedullary or medullary congestion. Houck (1950) estimated the renal plasma flow, glomerular filtration and tubular extraction ratios after injection of adrenaline in dogs and thought that no appreciable amount of blood was diverted from the cortex. The same author (Houck, 1951) found evidence of efferent arteriolar spasm demonstrated by intra-aortic injection of Indian ink suspension although he could not confirm the occurrence of juxtamedullary diversion of blood in dogs after injection of 21-81 γ/kg. epinephrine. Moyer and Handley (1951) using sciatic nerve stimulation in dogs could not find evidence of diversion by renal clearance tests and other biochemical methods. Insull *et al* (1950) after stimulation of sciatic nerve and of the renal plexus and after induction of acute bleeding in rabbits noted that the distribution of Janus green injected into the aorta did correspond to that seen by the Oxford workers. They could not however agree that this picture was related to corticomedullary diversion as the renal blood flow was markedly reduced. Reubi and Schroeder (1949) on the basis of renal clearance and other studies after injection of epinephrine and histamine in man and in dog did not find evidence of shunting in the kidney. The authors however thought that this did not disprove the existence of such bypass.

Observations on Human Cases

The possible occurrence and importance of corticomedullary diversion in man has been seriously doubted. Bull (1951) excluded the possibility of any appreciable diversion in 'acute tubular necrosis' in which reduction of renal blood flow and increase of renal arteriovenous oxygen difference were found. Maxwell and his coworkers (1950) and Smith (1951) recollected the observations made by Sirota (1949) in carbon tetrachloride poisoning and by Clark *et al* (1950) and Breed and Maxwell (cited by the authors) during the clearance and other studies in anuria following transfusion reaction in man. They have argued against the occurrence of diversion in traumatic or toxic anuria on the following grounds: (i) renal blood flow is markedly reduced, (ii) renal A-V oxygen difference is increased, (iii) EPAH recovers earlier than PAH clearance and (iv) no clear morphological evidence of cortical ischaemia in human kidneys is available. Clark *et al* (1950) however recorded the renal arteriovenous gas differences to be within the normal range in oliguria from transfusion reaction.

On the other hand Solymoss (1949) has recorded an instance of the occurrence of the phenomenon in an eclampsia kidney by the use of 'benzidine reaction'. The present author (De and Sengupta, 1951, De *et al*, 1953b) has more recently demonstrated what may be taken as evidence of corticomedullary diversion of blood in various human disorders associated with obstetrical, surgical and medical shock including cholera and with asphyxia. He used Pickworth's stain for blood vessels for histological study of the kidneys after death.

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An analysis of the various reports reveals three important factors which may be taken to account for a direct conflict of the evidences emerging from these studies on corticomedullary diversion.

(i) The species of the animal experimented upon seems to have some bearing. Most of the negative results have been obtained when dogs were used (Maluf, Study and Shipley, Draper and Whitehead, Houck, Dole *et al*, Moyer and Handley, Reubi and Schroeder). Draper and Whitehead (1949) and Moyer *et al* (1950) in the same type of experiments obtained positive results with rabbits and negative results with dog. Daniel *et al* (1952) confessed that dogs in particular *do not readily* exhibit the phenomenon. Draper and Whitehead (1949) thought that there is greater technical difficulties involved in the histological demonstration of a renal shunt in dogs than in rabbits. Goodwin *et al* (1949) have considered that there are wide anatomical and physiological variations among different individual animals and among different species. In spite of these differences Franklin (1951) recollects that the phenomenon has been demonstrated in all the mammals so far tested including seals.

(ii) The dose and/or intensity and nature and site of the stimulus applied also appear to have important parts. Among the various stimuli employed by Goodwin *et al*, direct stimulation of the renal nerves yielded the best positive results. Kahn and his colleagues following the same technique as that of the Oxford workers obtained negative results. One of the drugs they used was pitressin in doses of 0·75 to 2 units/kg. in rabbits while the corresponding doses employed by the Oxford workers were 0·2 to 20 units/kg. Again the optimum dose of adrenaline hydrochloride used in rabbits successfully by the Oxford team and by Montague and Wilson was 0·1 mg/kg. while Moyer *et al* found satisfactory results with no more than 0·02 mg/kg. On the other hand Kahn *et al* used 0·15 mg/kg. of the same drug which was rather high for rabbits and which for this reason induced complete renal ischaemia instead of the typical picture obtained by the other workers. With faradic stimulation of the central end of severed sciatic nerve for 1·5 to 5 minutes they obtained evidence of partial cortical ischaemia or complete ischaemia not confined to the cortex in only 3 out of 11 animals. The nature and intensity of the stimulus applied by Kahn *et al* to the nerve differed from those used by Trueta *et al* (1947) who finally crushed the nerve with artery forceps to get the typical response. Besides Goodwin *et al* confessed that many of their earlier experiments failed while the later ones gave more uniformly positive results. This indicates the necessity of attention to minute details of the

technique which can be acquired only by long and close familiarity with the individual methods.

(iii) The techniques of actual demonstration of the occurrence or otherwise of the phenomenon have also differed widely. They include observation of blanching of the surface of the kidney, serial angiographic and radiomicrographic studies after introduction of radio-opaque substances into the circulation, gross and microscopic examination of the cut surface of the kidney with and without intra-arterial (aorta, heart or renal artery) or intravenous injection of dye, mercuric sulphide or of Indian ink under varying or indefinite artificial pressure during life and with intravascular injection of Indian ink or neoprene latex after death and demonstration of vascular pattern by using Pickworth's stain for blood vessels on thick frozen sections. Besides, biochemical methods of measurement of renal blood flow by diodrast or PAH clearance, of glomerular filtration, of extraction ratios and of renal A-V oxygen difference have also been used.

The observation of blanching of the kidney surface does not give any idea of what is going on inside the depth of the kidney substance but it is a very helpful method in experienced hands (Franklin, 1952) engaged in elucidating the underlying mechanism of the renal vasoconstriction. The histological examination of thicker sections after intra-arterial injection of non-diffusible dye or ink has been extensively used with widely varying results. Unless it is ensured that the pressure of injection is not pushing the injection mass into ischaemic areas, this method can hardly be relied upon. This criticism applies especially in those instances where the mass has been injected under arbitrary pressure into the renal artery either during life (Dole *et al*, 1946) or after death (Trueta *et al*, 1947, Trueta, 1950). Moyer *et al* found that when Indian ink was injected into the renal artery of rabbits at a pressure higher than 80 mm. Hg. the cortex was flooded with ink even under epinephrine which could induce cortical ischaemia in their hands. The exact technique employed by Trueta and his co-workers in injecting through the aorta during life was more reliable. They used a pressure sufficient to keep the head of the column of injection mass just beyond the origin of the renal artery. Kahn *et al* injected similarly but at a pressure 10 mm. Hg. higher than the carotid pressure which cannot be so safely relied upon. Intravenous injection of the mass is safest and has been successfully used by Arcadi and Farman, Draper and Whitehead and by Goodwin *et al* to demonstrate the diversion. The technique of Schlegel and Moses in which they appear to have used free hand slices of the kidney instead of sections does not ensure uniform thickness between different pieces and between different areas of the same piece. Besides, patchy ischaemia may escape detection in too thick sections. Serial renal angiography after injection of radio-opaque substances reveals the successive changes following the application of the stimulus—but it does not define the actual vascular channel by which the blood may be diverted. The demonstration of vascular pattern in thick frozen sections of kidneys after death by Pickworth's method in which the red cells contained within the permeable vascular channels are stained alone does not reveal the actual circulatory adjustments occurring in the kidney during life but it gives a reasonably faithful picture of the vascular pattern at the time of death. It is definitely superior to the injection techniques where artificial pressure is used to introduce the injection material.

Regarding the use of renal clearance methods the experiments of Maluf (1949), Study and Shipley (1949) and of Van Slyke (1948) indicate that it may sometimes be quite unreal to equate the PAH or diodrast clearance with the renal plasma flow. Black and Saunders (1949) have discussed the hazards and enumerated the criteria to be satisfied for using clearance methods in the study of the problem of corticomedullary diversion. The invariable association of gross changes in the general circulation is a great handicap in attempts to resolve the question of shunting in relevant pathological conditions in man by these methods. The same criticism applies to the use of renal A-V oxygen difference as Maxwell *et al* have emphasized the necessity of the existence of normal renal blood flow for such studies to be helpful. Besides these authors agree that the normal renal A-V oxygen difference in man is so small that minor alterations are difficult to interpret and risks of technical error are great.

Thus it is obvious that besides individual and specific differences in susceptibility and also in the nature and intensity of the initiating stimulus, differences in the techniques employed to prove or disprove the occurrence of the phenomenon are also to a large extent responsible for the storm of controversy and confusion prevailing over the problem at the moment. Smith (1951) in spite of his disagreement with the Oxford workers has conceded that the available evidences are not conclusive and that traumatic conditions comparable to those employed in rabbits might elicit the phenomenon in man. Further studies preferably with angiographic methods during life are desirable before the last word may be said about it.

Possible Mechanism of Corticomedullary Diversion

(1) *Renal vasoconstriction and diversion*—A lot of anatomical and biochemical work has been done on the subject of renal vasoconstriction in experimental animals with drugs and nerve stimulation and in man under physiological and pathological conditions and it is universally agreed that the tone of the renal vasculature is most mercurial responding to many diverse influences by quick constriction. As Leiter (1948) puts it,—"Renal vasoconstriction is a rather general reaction occurring whenever the efficiency of the integrity of the circulation is threatened . . . . the causes are too numerous to mention . . . . the immediate effect is to make more of the low cardiac output available to vital areas." It is also known that the

renal cortex carries the muscular arterioles and arteries while the medullary vessels—the vasa recta resemble capillaries in the structure of their wall (Trueta *et al*, 1947; Maxwell *et al*, 1950; Smith, 1951). Landois (1891) has noted that the walls of the arteriae rectae verae are muscular while those of the arteriae rectae spuriae are not. Even then it must be conceded that contractile elements of the renal vasculature are minimal in the medulla and the apparatus of vascular resistance is chiefly situated in the cortex. The medulla is incapable of offering any effective obstruction to the flow of blood when the kidney is so called for. Therefore whenever there may be any occasion for the smaller renal vessels to go into spasm, the blood which has already been admitted and which may still find its way into the larger branches of the renal artery is likely to seek out the medullary pathway of least resistance in face of constriction of the cortical vessels. Be it clear however that the consequent engorgement of the medullary vessels should be regarded as a passive process and not as due to an active dilatation. It is not that the stimulus metes out a differential behaviour towards the cortical and the medullary vessels. Maegraith and the Truetas—the sponsors of the idea of corticomedullary diversion do not appear to have given due consideration to this aspect of the mechanism.

(2) *Mechanism of renal vasoconstriction*—The actual mechanism underlying the characteristic renal vasoconstriction under so many diverse conditions remains shrouded in mystery. The experiments of Hoff and his coworkers (1951) suggest that stimuli from the brain may elicit the phenomenon and may be involved in those conditions where the brain may be directly or indirectly affected. Franklin (1952) has described experiments in which acute distension of the uterine horns in rabbits could bring about renal vasoconstriction by reflex as well as by humoral (adrenal) mechanisms. This factor may well be responsible for the behaviour of the kidney in obstetrical physiology and pathology. On the other hand, several observations (Franklin *et al*, 1949; Beck *et al*, 1938; Adolph, 1934) would indicate that renal vasoconstriction can be induced by anoxia. As most of the pathological conditions in which such renal changes are encountered, are associated with shock, the anoxic factor may ultimately emerge as a common denominator. From the observations of Franklin and his coworkers (1949) that tracheal occlusion and administration of carbon monoxide fail to elicit vasoconstriction in the denervated kidney, it would appear that anoxia brings about such change through the mediation of the nervous and not of the humoral factor. It would still take a long way to define how and where the stimulus originates. Franklin *et al* (1951) suggest that spinal centres may be involved. Trueta *et al* (1947) and De *et al* (1950, 1951) have respectively shown that staphylococcus toxin and cholera toxin can bring about cortical ischaemia. Trueta (1951) has indicated the possible role of toxins in initiating the diversion but nervous and/or humoral vasospasm through shock and anoxia cannot be excluded in such instances. Pressor substances like renin or reflexes (Maegraith and McLean, 1942) originating from the ischaemic and damaged kidney itself may be concerned in maintaining the vasoconstriction and diversion once it has set in.

(3) *The vascular channels for diversion*—Trueta and his coworkers (1946) noted in their preliminary report that the subcortical vessels and the loops of vasa recta remain patent when the rest of the cortex is rendered ischaemic. Later, they (1947) specified the juxtamedullary glomeruli and their efferents breaking up into vasa recta spuria as the exact vascular pathway for corticomedullary diversion. There was a series of interesting correspondence in the columns of the *Lancet* regarding the juxtamedullary glomeruli. Soon after the publication of the preliminary report of the Oxford workers, Heggie (1946) pointed out that the diverted medullary circulation could well be maintained through the efferents of the juxtamedullary glomeruli which he (Heggie, 1947) later claimed to have described in a meeting (July, 1941) of the Pathological Society of Great Britain and Ireland. The Oxford workers (Barclay *et al*, 1946) were reported to have said at a meeting of the Physiological Society that the "by-passing is effected at least in part *via* the vasa recta". As appears from a later communication (Trueta and Barclay, 1947) they had also demonstrated at the same meeting the vasa recta arising from glomeruli at the base of the cortex and at that time called them basal glomeruli. Heggie however was reported in the *Lancet* (1947) to have said at a meeting of the Royal Society of Medicine that he had indicated to the Oxford workers the role of the juxtamedullary glomeruli in the intrarenal redistribution of blood. This provoked an immediate refutation from Trueta and Barclay (1947) who however confessed that they had *readily adopted* the term juxtamedullary glomeruli suggested by Heggie (1946). In recollecting this little episode one may be left to ponder if in the ready adoption of the term the Oxford workers have been adequately critical in their acceptance of the exclusive role of the juxtamedullary glomerular channel in corticomedullary diversion. Of course various workers have shown in their experimental animals that these glomeruli do offer a ready passage to the blood bypassing to the medulla but this does not necessarily exclude any other channel especially when observations on human materials are taken into account. In the author's study of human kidneys (De and Sengupta, 1951, De *et al*, 1953b) instances of complete cortical ischaemia with engorgement of the medullary vessels were recorded which suggest the operation of some medullary bypass independent of the juxtamedullary glomeruli. Solymoss (1949) in his plea to demonstrate the "Trueta phenomenon" in an eclampsia kidney appears to have surmised the existence of the juxtamedullary bypass although as has been indicated by De and Sengupta

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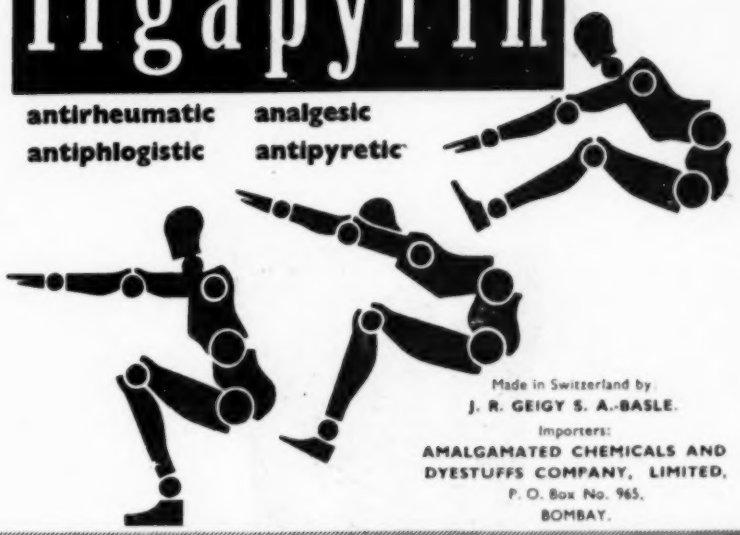

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(1952) his illustration and description speak rather in favour of a nonglomerular bypass.

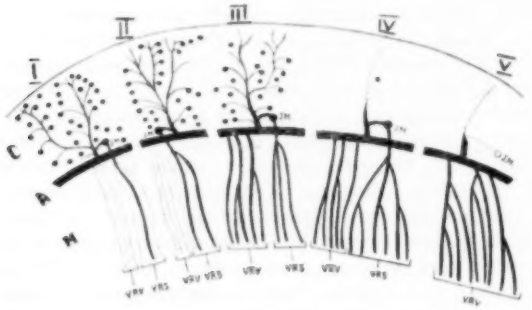

DIAGRAM SHOWING SUCCESSIVE STAGES IN THE PROGRESSIVE CONSTRICTION OF CORTICAL VESSELS IN THE KIDNEY. VEINS AND INTERTUBULAR CAPILLARIES OMITTED

C—cortex, M—medulla, A arcuate artery, J. M.—juxtamedullary glomerulus, V.R.V.—vasa recta vera, V.R.S.—vasa recta spuria. I—normal vascular pattern, II—slight patchy cortical ischaemia, III—more advanced cortical ischaemia, IV—advanced cortical ischaemia, J.M.—still functioning, V—complete cortical ischaemia, V.R.V.—alone diverting blood to medulla.

When the cortical vessels are stimulated to undergo constriction with adrenaline or other drugs or measures, the ischaemic process tends to commence from the superficial cortex and gradually spreads deeper so that the juxtamedullary glomeruli are the last to be involved. The latter glomeruli had just escaped at the stage which was most frequently encountered by the Oxford workers. With the next stronger stimulation they could use, the whole kidney became ischaemic when the arcuate arteries as well went into constriction thus cutting down the possibility of any medullary channel arising therefrom to reveal its role. It is still to be proved by these workers that their stimuli were graded enough to exclude any other possible pathway to the medulla. The failure of Kahn and his coworkers to get hold of the particular stage where the cortical vasoconstriction stopped short of the level of the juxtamedullary glomeruli may be taken to indicate that their stimulus was even less graded than that of the Oxford workers.

ARTERIAE RECTAE VERAE AND ARTERIAE RECTAE SPURIAE

The question of the existence of an alternative or additional non (juxtamedullary) glomerular bypass to the medulla from the arcuate arteries resolves itself into the much debated and yet undecided question of the presence or otherwise of arteriae rectae verae. Their existence has been confirmed by Ludwig (1852), Virchow (1857), Golubeg (1893) and MacGraith and McLean (1942) while Huber (1906-7), Gerard (1911), Traut (1923) and MacCallum (1926) have denied it. Trueta and his coworkers (1947) have collected evidences of different stages of degeneration and distortion of the juxtamedullary glomeruli and on the basis of these evidences believed the apparently nonglomerular medullary channels (i.e arteriae rectae verae) as representing nothing more than the final stage in the degeneration of the latter. While it may be conceded that some of the above channels may originate in this way, it seems unwarranted to ascribe the same origin to all the nonglomerular channels to the medulla. On the other hand, Clara (1938) admitted the presence of arteriae rectae verae after reviewing the literature of about a century and Shonyo and Mann (1944) on the basis of observations after neoprene injections confirmed the presence of direct aglomerular channels to the medulla. Black and Saunders (1949) have questioned the predominant role assigned to the juxtamedullary glomeruli by the Oxford workers and suggested that the medullary pathway may be largely nonglomerular. In the light of these records and of the observations made during the study of human material by Pickworth's stain, one feels inclined to agree with Maegraith (1948) that the emphasis laid by the Oxford workers solely on the juxtamedullary bypass should be reconsidered.

BILATERAL CORTICAL NECROSIS AND JUXTAMEDULLARY GLOMERULI

The escape of the juxtamedullary glomeruli in bilateral cortical necrosis described by Dunn and Montgomery (1941) has often been cited as evidence of operation of the juxtamedullary bypass (Sophia, 1952; Trueta *et al*, 1947). It may be seen however that even the surviving glomeruli were not at all normal but exhibited evidences (French, 1950; De *et al*, 1953b) which suggest that the juxtamedullary glomeruli had also suffered from the results of ischaemia at some stage of the disease. It may be recalled here that the careful histological records of two cases of bilateral cortical necrosis by Scriver and Oertel (1930) do not indicate in any way the escape of the juxtamedullary glomeruli. Duff and More (1941) have noted that the necrosis may involve the whole thickness or the cortex down to the base of the pyramids. Moreover, the present author (De *et al*, 1953b) has come across two instances of bilateral cortical necrosis developing after attack of cholera where the juxtamedullary glomeruli at the areas of infarction were also necrosed. This further shows that the latter glomeruli do not constantly nor necessarily escape the ischaemic process and thus serve as the pathway for diversion of the cortical blood.

POSSIBLE ROLE OF CORTICOMEDULLARY DIVERSION IN THE GENESIS OF ACUTE RENAL FAILURE IN MAN

The condition of acute renal failure attracted the attention of clinicians and pathologists in Germany during the first world war and was brought to limelight during the second when it was observed in Britain in air raid casualty cases subjected to crushing for long periods. The subject has been adequately reviewed among others by Bywaters (1944). Darmady (1947) and by Van Slyke (1948). The role of reduction of

renal blood flow and renal ischaemic anoxia associated with low blood pressure has been recognised (Lucké, 1946; Van Slyke, 1948) and a superadded factor of renal vasospasm was brought to light by the renal clearance studies of Lauson *et al* (1944) and of Cournard *et al* (1943). The renal damage has also been ascribed to exogenous and endogenous toxic products including heme compounds. It may be observed here that even in the infliction of renal damage by well known nephrotoxic substances renal cortical ischaemia has emerged as an important factor in the studies of Oliver *et al* (1951). At the same time, the strong renal vasoconstriction that can be induced by heme compounds (Mason and Mann, 1931; Reid, 1929; Corcoran and Page, 1945) indicate that their apparent nephrotoxic action may be the manifestation of renal ischaemia. The anuria and oliguria has been ascribed to tubular obstruction and to unselective reabsorption through damaged tubules. The role of mechanical obstruction of tubules has however been rejected by Maegraith *et al* (1945) and by Bywaters (1944). The factor of unselective reabsorption has been considered by Van Slyke (1948) as a tentative rather than a demonstrated explanation of postshock renal failure.

Tomb (1942, 1943) envisaged a single aetiological factor in the development of anuria and of renal damage which are found in several diverse conditions including cholera and crush syndrome and thought them to be the renal manifestations of anoxia arising from various causes. Maegraith and his coworkers (1945) enumerated many surgical, medical and obstetrical conditions with a similar though not identical morphological and functional derangement of the kidney and advanced the unitary, concept of renal anoxia as the basic aetiological factor. Lucké (1946) also collected a long list of such conditions in which he identified a common morphological lesion viz., retrogressive changes in the lower segments of the nephrons but could not single out any particular factor in the genesis of oliguria and/or anuria and of renal damage. At the Royal Society of Medicine, Dible (1950), Bull (1950) and Darmady (1950, 1952) discussed about these renal disorders under the title 'acute tubular necrosis' and believed that the structural and functional pattern was uniform though the causes varied widely.

On the other hand, Bywaters (1948) could not agree with the unitary anoxic hypothesis of Maegraith and his coworkers while the emphasis laid by Lucké on the lower nephron has been seriously questioned (Leiter, 1948; Darmady, 1950, 1952; Smith, 1951; Gaberman *et al*, 1951; Oliver *et al*, 1951). De (1951) thought that the term 'acute tubular necrosis' was not a happy one as necrosis may not be found at all stages of the disorders.

Meanwhile Trueta *et al* (1947) and Maegraith (1948) chiefly on the basis of the experimental observations of the Oxford workers suggested intrarenal redistribution of blood with consequent cortical ischaemia to form a common basic factor in the pathogenesis of the structural and functional derangement of the kidneys found in the diverse human pathological conditions. Trueta *et al* (1947) however confessed that from the findings reported on the human materials it is rather difficult to decide about the role of corticomedullary diversion in such cases. Franklin (1949) and Sophian (1949) also advanced the hypothesis that pregnancy toxaemia includes a progressively increased tendency for the corticomedullary shunt to be brought into operation. Sheehan (1951) described nine degrees of parenchymatous changes in the kidneys of accidental haemorrhage ranging from mild degeneration to bilateral cortical necrosis and related them to cortical ischaemia. It appears from the short report published that the lesions were confined to the cortex but the condition of the medulla is omitted. The present author (De and Sengupta, 1951) correlated the site and degree of renal damage with those of cortical ischaemia associated with intrarenal redistribution of blood with the help of Pickworth's stain for blood vessels on kidneys from cases of eclampsia, cholera, burns, asphyxia and copper sulphate poisoning. But the number of kidneys studied from each condition was limited. He (*De et al*, 1953b) has more recently studied by the same technique kidneys from thirty-one cases dying of cholera. Evidence of diversion of blood was found only in those stages of the disease which are associated with oliguria and/or anuria and not in the stage of reaction characterised by free flow of urine. Histological studies indicated the cortical ischaemia to be extensive or even patchy and irregular though the cut surface might appear very pale in gross. The patchy character of cortical ischaemia in other conditions of acute renal failure has also been indicated in the microdissection and experimental studies of Oliver *et al* (1951) and in the clearance studies of Lauson *et al* (1944). The present author was struck by the larger number of glomeruli which might retain a lot of blood though the patient died with anuria in cholera and has thought that cortical ischaemia could not fully explain the anuria to which reduced circulation of the already existing blood or ischaemic glomerular changes definitely contribute. There was little evidence of cortical damage in most of the cholera cases dying of anuria of about twenty-four hours' duration in the stage of shock. It reminds us of the suggestion made by Smith (1951) that if the renal ischaemia is incomplete a mere trickle of blood may suffice to maintain vitality in large areas of the renal parenchyma and the critical period for renal damage may be indefinitely long. The occurrence of haemoglobinaemia and/or haemoglobinuria which has sometimes been encountered in cholera (De *et al*, 1952, 1953a) appeared to intensify the cortical ischaemia and corticomedullary diversion and to aggravate the urinary disturbances and parenchymatous damage. In fact all the cases of postcholeraic uraemia (3 out of 7) which had been specially investigated exhibited haemogolobinaemia and/or haemoglobinuria

during the stage of shock. Further work on the role of haemoglobinuria in the development of postcholeraic uraemia is being carried out in this laboratory to confirm the significance of these preliminary observations. However the plea for rigorous search for evidence of intravascular haemolysis and pigment excretion in all conditions of circulatory failure and systemic reactions advanced by Smith appears to be fully justified from the above observations in such an apparently simple disease like cholera whose systemic effects have generally been regarded as the outcome of fluid loss with consequent dehydration and shock. It also makes one ponder if Mallory's (1947) theory that renal damage is never progressive in absence of pigment nephropathy may in time find extension from his battle injury cases to cover those encountered in civil life as well. Experimental works indicate that injection of heme compounds into the circulation can bring about acute renal failure in the presence of dehydration and shock with consequent renal ischaemia (Smith, 1951). The actual mechanism by which these compounds produce renal disturbances is still uncertain. The possible roles of tubular obstruction and of tubular damage have been much debated while the intense renal vasoconstriction which can be induced by haemoglobin or its derivatives (Mason and Mann, 1931; Reid, 1929; Corcoran and Page, 1945) suggests that it aggravates the renal ischaemia already existing under the primary disease and the subsequent renal damage and uraemia is the result of the reinforcement of one factor by the other. Darmady (1952) also recognises the major complimentary role of haemolysis in the production of irreversible renal damages in acute tubular necrosis.

It is thus seen that corticomedullary diversion which is nothing more than the manifestation of a stage in the progressive constriction of the renal arterial tree appears to play an important though not an absolute role in the development of the renal disturbances in cholera and possibly in eclampsia. The findings of De and Sengupta (1951) make it probable that a similar mechanism may operate in other conditions as well. A number of kidneys from each of the other disorders associated with acute renal failure should be studied with an open and unbiassed mind before a unitary concept may be accepted.

Conclusions and Summary

The evolution of the concept of corticomedullary diversion is traced from its origin to its present position. The conflicting observations are thought to be due to differences in the techniques and in the species of animals used. Further studies preferably by angiographic methods during life are indicated before the last word may be said about the problem.

Whenever there is any occasion for renal vasoconstriction, the blood which may still find its way into the kidney is likely to seek out an easy passage to and through the medulla. This is not due to any differential behaviour of the stimulus but to the location of the apparatus of vascular resistance inside the cortical zone of the renal circuit.

The evidences from some pathological human materials especially from cholera kidneys suggest that the juxtamedullary bypass involving the juxtamedullary glomeruli, their efferents and the arteriae rectae spuriae comes into operation during the corticomedullary diversion. But as the cortical vasoconstriction spreads deeper down the interlobular arteries, the juxtamedullary pathway is closed down and the arteriae rectae verae alone continue to divert the blood into the medulla. The associated cortical ischaemia is not always uniform but may be patchy and irregular in distribution. It may contribute to the causation of oliguria and/or anuria and of renal damage in which the associated shock with consequent slowing of the circulation also plays an important role. These changes are likely to be more pronounced and less reversible when heme pigments are liberated in the plasma.

The formulation of a unitary concept should await further studies.

Acknowledgment

I wish to express my sincere gratitude to Prof. G. R. Cameron, F.R.S., for his helpful suggestions and criticisms.

References

Adolph, E. F.—*Am. J. Physiol.*, **108**: 177, 1934.
Arcadi, J. A. and Farman, F.—*J. Urol.*, **62**: 756, 1949.
Barclay, A. E., Daniel, P. M., Franklin, K. J., Prichard, M. M. L. and Trueta, J.—*J. Physiol.*, **105**: 27, 1946.
Beck, L. V., Kempton, R. T., Richards, A. N.—*Am. J. Physiol.*, **122**: 676, 1938.
Black, D. A. K and Saunders, M. G.—*Lancet*, **1**: 733, 1949.
Bull, G. M.—Cited by *Brit. M. J.*, **1**: 1263, 1951.
Bywaters, E. G. L.—*J. A. M. A.*, **124**: 1103, 1944.
Idem—*Lancet*, **1**: 301, 1940.
Bywaters, E. G. L. and Dible, J. H.—*J. Path. Bact.*, **54**: 111, 1942.
Clara, M.—*Arch. Kreislaufforsch*, **3**: 42, 1938.
Clark, J. K., Barker, M. G., Crosby, A. P. (jr.)—*Am. J. Med.*, **9**: 268, 1950.
Corcoran, A. C. and Page, I. H.—*Texas Rep. Biol. Med.*, **3**: 528, 1943.
Cort, J. H. and Barron, D. H.—*Fed. Proc.*, **7**: 23, 1948.
Cournard, A., Riley, R. L., Bradley, S. E., Breed, E. S., Noble, R. T., Lauson, H. D., Gregerson, M. I., Richards, D. W.—*Surgery*, **13**: 964, 1943.
Daniel, P. M., Peabody, C. N., Prichard, M. M. L.—*Quart. J. Exp. Physiol.*, **37**: 11, 1952.
Darmady, E. M.—*Brit. J. Surg.*, **34**: 262, 1947.
Idem—Cited by *Brit. M. J.*, **7**: 1263, 1950.
Idem—*Proc. Roy. Soc. Med.*, **45**: 844, 1952.
De, M. N. and Chatterjee, K. D.—Bacteriology in Relation to Clinical Medicine, Theoretical and Applied, Calcutta, 1935.
De, S. N.—Proc. Second Annual Conference, Indian Assoc. Pathol., p. 50, 1950.
De, S. N., Sarkar, J. K. and Tribedi, B. P.—Proc. First Annual Conference, Indian Assoc. Pathol., 1950, p. 64.
Idem—*J. Path. Bact.*, **63**: 707, 1951.
De, S. N. and Sengupta, K. P.—*Lancet*, **2**: 1100, 1951.

Idem—*Ibid*, **2**: 42, 1952.
De, S. N., Sengupta, K. P. and Chanda, N. N.—*Brit. M. J.*, **2**: 22, 1952.
Idem—To be published, 1953a.
Idem—To be published, 1953b.
Dible, J. H.—Cited by *Brit. M. J.*, **1**: 1262, 1951.
Dole, V. P., Emerson, K. (jr.), Phillips, R. A., Hamilton, P. and Van Slyke, D. D.—*Am. J. Physiol.*, **145**: 337, 1946.
Draper, W. B. and Whitehead, R. W.—*Anaesthesia & Analgesia*, **28**: 307, 1949.
Duff, G. L. and More, R. H.—*Am. J. M. Sci.*, **201**: 428, 1941.
Dunn, J. S. and Montgomery, G. L.—*J. Path. & Bact.*, **52**: 1, 1941.
Franklin, K. J.—*Proc. Roy. Soc. Med.*, **42**: 380, 1949.
Idem—*Ibid*, **44**: 399, 1951.
Idem—*Lancet*, **2**: 1141, 1952.
Franklin, N. G., McGee, L. E. and Ullmann, E.—*Proc. Soc. Exp. Biol.*, N. Y., **71**: 339, 1949.
Idem—*J. Physiol.*, **112**: 43, 1951.
French, A. J.—*Arch. Path.*, **49**: 43, 1950.
Gaberman, P., Atlas, P. H., Kammerling, E. M., Ehrlich, L. and Isaacs, J.—*Ann. Int. Med.*, **35**: 148, 1951.
Gerard, M.—*J. Anat.*, Paris, **47**: 169, 1911.
Golubew, W. Z.—*Int. Mschr. Anat. Physiol.*, **10**: 541, 1893.
Goodwin, W. E., Sloan, R. D. and Scott, W. W.—*J. Urol.*, **61**: 1010, 1949.
Heggie, J. F.—*Lancet*, **2**: 436, 1946.
Idem—*Ibid*, **21**: 809, 1947.
Hoff, E. C., Kell, J. F. (jr.), Hastings, N., Sholes, D. M., and Gray, E. H.—*J. Neurophysiol.*, **14**: 317, 1951.
Houck, C. R.—*Fed. Proc.*, **9**: 63, 1950.
Idem—*Am. J. Physiol.*, **166**: 649, 1951.
Huber, G. C.—*Am. J. Anat.*, **6**: 391, 1906-7.
Insull, W. (jr.), Tillotson, I. G. and Hayman, J. J. (jr.)—*Am. J. Physiol.*, **163**: 676, 1950.
Kahn, J. R., Skeggs, L. T. and Shumway, N. P.—*Circulation*, **1**: 445, 1950.
Lancet—Report of Societies, **2**: 654, 1947.
Landois, L.—A Textbook of Human Physiology including Histology and Microscopical Anatomy with special Reference to the Requirements of Preventive Medicine. Translated from the 7th German edition with additions by W. Stirling, 4th Ed., 1891, London, 1, 485.
Lauson, H. D., Bradley, S. E. and Cournand, A.—*J. Clin. Invest.*, **23**: 381, 1944.
Leiter, L.—*Ann. Int. Med.*, **28**: 229, 1948.
Lucke, B.—*Milit. Surg.*, **99**: 371, 1946.
Ludwig, C.—*Lehrbuch. der Physiologie des Menschen.*, Leipzig, **11**: 255, 1852.
MacCallum, D. B.—*Am. J. Anat.*, **38**: 153, 1926.
Maegraith, B. and Findlay, G. M.—*Lancet*, **2**: 403, 1944.
Maegraith, B. G. and Havard, R. E.—*Ibid*, **2**: 213, 1946.
Maegraith, B. G. and Parsons, D. S.—*Ibid*, **2**: 415, 1945.
Maegraith, B. G. and McLean, F. J.—*Brit. J. Exp. Path.*, **23**: 239, 1942.
Maegraith, Brian—Pathological Processes in Malaria and Blackwater Fever, Oxford, Chap. VII. 1948.
Mallory, T. B.—*Am. J. Clin. Path.*, **17**: 427, 1947.
Maluf, N. S. R.—*Ann. Surg.*, **130**: 49, 1949.
Mason, J. B., Mann, F. C.—*Am. J. Physiol.*, **98**: 181, 1931.
Maxwell, M. H., Breed, E. S. and Smith, H. W.—*Am. J. Med.*, **9**: 216, 1950.
Montague, F. E. and Wilson, F. L. (jr.)—*Am. J. Physiol.*, **159**: 581, 1949.
Meyer, J. H. Conn, H. L. (jr.), Markeley, K. and Schmidt, C. F.—*Ibid*, **161**: 250, 1950.
Meyer, J. H. and Handley, C. A.—*Ibid*, **165**: 548, 1951.
Oliver, J., MacDowel, M., Tracy, M.—*J. Clin. Invest.*, **30**: 1307, 1951.
Reid, W. L.—*Am. J. Physiol.*, **90**: 168, 1929.
Reubi, F. C. and Schroeder, H. A.—*J. Clin. Invest.*, **28**: 114, 1949.
Schlegel, J. U. and Moses, J. B.—*Proc. Soc. Exp. Biol.*, N.Y., **74**: 832, 1950.
Scriver, W. de M. and Oertel, H.—*J. Path. Bact.*, **33**: 1071, 1930.
Sheehan, H. L.—*Proc. Roy. Soc. Med.*, **44**: 399, 1951.
Shonyo, E. S., Mann, F. C.—*Arch. Path.*, **38**: 287, 1944.
Smith, H. W.—The Kidney—Structure and Function in Health and Disease, New York, 1951.
Solymoss, A.—*Lancet*, **1**: 957, 1949.
Sophian, J.—*Proc. Roy. Soc. Med.*, **42**: 387, 1949.
Study, R. S. and Shipley, R. E.—*Am. J. Physiol.*, **159**: 592, 1949.
Tomb, J. W.—*J. Trop. Med.*, **45**: 125, 1942.
Idem—*New Zealand J. Med.*, **42**: 75, 1943.
Traut, H. M.—Carnegie Inst., Washington, Publ. No. 332, 15, 103. Contribution to Embryology, No. 76, 1923.
Trueta, J.—*Lancet*, **2**: 415, 1945.
Idem—*Glasgow Med. J.*, **31**: 217, 1950.
Idem—*Proc. Roy. Soc. Med.*, **44**: 399, 1951.
Trueta, J. and Barclay, A. E.—*Lancet*, **2**: 772, 1947.
Trueta, J., Barclay, A. E., Daniel, P. M., Franklin, K. J. and Prichard, M. M. L.—*Ibid*, **2**: 213, 1946.
Idem—Studies of the Renal Circulation, Oxford. 1947.
Trueta, J. and Barnes, J. M.—*Brit. J. Surg.*, **30**: 74, 1942.
Van Slyke, D. D.—*Ann. Int. Med.*, **28**: 703, 1948.
Virchow, L.—*Virchows Arch.*, **12**: 310, 1857.

CASE NOTES

EWING'S TUMOUR OF THE CLAVICLE

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Ewing's tumour affecting the clavicle is rare. It generally affects long bones during growth periods but Geschickter and Copeland (1936) cite 2 cases occurring in clavicle from the register of bone sarcoma in John Hopkins where out of about 650 sarcomas of bone about 15 per cent were found to be of Ewing's variety.

The following is an interesting case record of Ewing's tumour affecting the clavicle, proved by biopsy and showing characteristically remarkable regression with deep x-ray therapy.

Case Report

J. B., a young healthy looking man, aged 20 attended the Orthopaedic Department in May 1951 with complaints of swelling over left shoulder and constant

pain more marked after exercise. He gave history of a fall on the left shoulder while taking exercise on the horizontal bar followed by slight swelling and pain on the left shoulder which subsided with rest. But he felt pain off and on over the left shoulder and a swelling appeared about 4 months back which gradually increased accompanied by constant boring pain, dragging sensation, slight feverish feeling and deterioration of general health.

On examination, there was a soft doughy swelling over the left supraclavicular region extending over lateral 2/3rds of the clavicle. Skin was free with a few distended veins. The swelling occupied the posterior triangle of the neck; its margin was indistinct and not attached to any tissue, its feel was doughy and lobulated, fluctuation and tenderness were not present. There was no sign of inflammation or transmitted pulsation. The left clavicle was felt in its entirety with tenderness over the outer third. The shoulder joint movements were free and painless but there was wasting of muscles around the left shoulder. No tenderness could be elicited on cervical spines nor was any muscle spasm present. X-ray at this stage was not conclusive but there was slight osteomyelitic change in the outer end of the clavicle as shown by destruction and granular new bone formation. S.R.—5 mm. W.R.—negative. The patient was advised rest with arm in a sling and a course of penicillin injections (40 lacs) was given.

On review after three weeks the swelling was more marked and tense and no improvement was noticed. Biopsy was done on 6-6-51, the swelling was opened and greyish white cheesy material like brain tissue was found without any capsule, infiltrating below the deep fascia of the neck into the tissue plane of the neck and apparently arising immediately from the periosteum of the clavicle. The wound was closed and it healed on first intention. Biopsy report was that of Ewing's tumour and deep x-ray therapy was advised. X-ray at this stage showed the typical onionpeel arrangement of new bone formation, expansion with some destruction of the clavicle (Fig. 1, *vide* Plate). After 5 exposures of deep x-ray therapy, the swelling vanished completely, but a course of 18 was given. The improvement in clinical and general condition was remarkable and the patient left for his village home apparently cured.

The treatment should be solely radiotherapeutic. In view of natural history of the tumour it is not worth while undertaking mutilating operations.

The case was followed up regularly for recurrence of the condition by check radiology of the skeleton.

Plan of treatment followed in the case—200 K.V. 10 ma 0·5 mm. cut 1 mm. Al filter 50 cm. f.s.o. 15×15 cm^2 field. Two opposing fields.

T.D. = 3572 r/3 weeks time 19 treatments.

Skin D = 3610 r/3 weeks time 19 treatments.

Treatment given during the period 21-6-51 to 13-7-51.

Result—Complete disappearance of soft tissue tumour and consolidation of bone in the treated area.

Patient remained free from symptoms till 15-11-52 (about 16 months) after that slight swelling occurred at the primary site along with pain which disappeared after another course of x-ray therapy by a 10×10 cm^2 direct field—tumour dose 1800 r given in 12 days' time from 18-11-52 to 29-11-52.

Patient is now under follow up.

Discussion

Regarding diagnosis of this condition, it is generally confused with low grade inflammatory disease of the bones as low grade pyogenic, syphilitic, tuberculosis of the bone and osteogenic sarcoma. Because of the doughy and lobulated feel and arising as it does from soft tissues of the neck, it may be mistaken for lipoma. Biopsy is helpful and clinches the diagnosis. The danger of disturbing the tumour mass is not great. Therapeutic test with deep x-ray therapy is another confirmatory test. Incidence is about 15 per cent of all malignant bone tumours and it might affect any bone, in younger people usually following an indefinite history of trauma.

Regarding the nature of Ewing's tumour—certain points are in favour of its being a primary sarcoma of bone e.g., age incidence, location, cellular nature, metastasis and high percentage of fatality while response to irradiation, resemblance of cells to lymphocytes, x-ray appearances simulating early cases of lymphatic leukaemia favour the diagnosis of primary lymphoma.

In the original description of Ewing (1922), this was thought to be an endothelioma, though challenged by many. In recent years Ewing thinks that the scope of endothelioma is wide and he feels it unwise to insist on the endothelial origin of this neoplasm.

The outlook is extremely grave, though early success with irradiation gives a false sense of security to the surgeon and the patient.

Summary

A case of Ewing's tumour of the clavicle proved by biopsy is presented.

Diagnosis and nature of the tumour are discussed.

Follow-up of the case for 16 months after treatment with deep x-ray therapy showed no abnormality.

Acknowledgment

We are grateful to Dr. D. C. Chakravarty, Principal and Superintendent, Medical College Hospitals, Calcutta, for allowing us to publish the case. Our thanks are due to Dr. M. L. Barman, Prof. S. Mukherjee, Prof. K. C. Sarbadhikary and Prof. B. P. Tribedi for collaboration.

References

Bloodgood, J. C.—*South M. J.*, **19**: 541, 1926.
Idem—*Radiology*, **3**: 432, 1924.
Coley, W. B.—*J. Bone & Joint Surg.*, **10**: 420, 1928.
Ewing, J.—*Arch. Surg.*, **4**: 485, 1922.
Geschickter, C. F. and Copeland, M. M.—Tumours of Bone, 1936, New York.
Nichols, B. H.—*Sur. Gynec. & Obstet.*, **35**: 301, 1922.

INTESTINAL AMOEBOMA

Report of Three Cases with Chloroquine Therapy

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Intestinal amoeboma is not a very common condition; only few cases have been recorded so far. Chaudhuri and Rai Chaudhuri (1946) reported one case; five others were reported by Reddy and Rangam (1946). Three cases of intestinal amoeboma seen recently are detailed below. These cases have a special feature of interest, showing as they do, the remarkable effect of chloroquine, a drug known to have least effect on intestinal amoebiasis.

For brevity, instead of a detailed narrative of each case, an attempt has been made to present only the salient features of these cases in a tabular form (Tables 1 and 2).

Discussion

Amoeboma is a term used to designate an amoebic granulomatous condition of the large gut, so named because of its semblance to a new-growth in appearance and effect (Ochsner and De Bakey, 1942): The exact pathogenesis of this granuloma is not known. It has been suggested that superimposition of secondary infection leads to collection of inflammatory exudates; these together with the cytolised, necrosed products of original amoebic infection help to form the granuloma (Reddy and Rangam, 1946). These granulomas may at times be big enough to cause a sub-occlusion or even occlusion of the gut at the site of its occurrence, directly or sometimes indirectly by effecting an intussusception through inducing an irregular peristalsis. In presence of a complete obstruction, in the face of a surgical emergency, the original cause leading to it is likely to be missed, only to be unmasked postoperative from the pathology of the resected gut. In cases of sub-occlusion, however, the diagnosis of intestinal amoeboma is rendered difficult because of the other more common clinical conditions that arise in differentiation e.g., intestinal tuberculosis, actinomycosis and new growths; under such circumstance, for a diagnosis of intestinal amoeboma to be made, the clinical possibility of such a condition has to be borne in mind. It has to be appreciated that a clinical diagnosis of amoeboma is hazardous, yet it appears that a persistent abdominal pain with varying intensity in association with a mobile tender lump in right lumbar or iliac region, unattended with severe constitutional disturbance or toxaemia, should raise a suspicion of intestinal amoeboma, particularly if the patient is a chronic dysenteric ir if dysenteric motions are associated.

Barium meal skiagram and barium enema plates help to demonstrate the evidence of a filling defect and locate its site.

Examination of stool appears to be of limited value in a country where intestinal amoebiasis is so widely prevalent; for in a suspected case, though presence of entamoeba in stool is highly suggestive, yet it does not vouchsafe for the lump

Table 1—Showing the Essential Clinical Features of the Cases

No.	*Name, age, sex & religion*	*Duration of illness*	*Chief complaints* Pain in abdomen: its nature	Associated diarrhoea or dysentery	Vomiting	Fever	*Clinical findings in abdomen*	*Past history of amoebiasis & treatment undertaken*
1.	Mrs. R.K., 34, F., M.	3 weeks	A sense of heaviness with constant dull aching pain in right lumbar region with acute exacerbation at times	Diarrhoeic motions in bouts	Nausea troublesome. Vomiting occasional	Irregular: varying usually between 99°-101°F.	A mobile tender lump, (4″ × 1½″) in right lumbar region	Chronic dysentery over ten years. Attacks — occasional. Last date of emetine intake —6 months ago
2.	P.S., 36, M., H.	8 weeks	A sense of fullness in right iliac fossa and lumbar region with constant aching pain, intercepted by acute gripes	Diarrhoeic motions in bouts	Nausea 1 week. Vomiting occasional	Irregular inconstant, low grade: varying usually between 99°-100°F.	A mobile tender lump, (3″ × 2″) in right lumbar region	Chronic dysentery over 4 years. Attacks — infrequent. Irregular intake of emetine and enteroquinol. Last date of emetine intake (g.1), 10 days ago
3.	A.M., 26, M., H.	3 weeks	Dull aching pain in right iliac fossa, intercepted by severe gripes at times	Nil	Nil	Irregular inconstant low grade fever: usually 99-100F..	An acutely tender slightly mobile lump (2½″ × 1½″) in right iliac fossa	Chronic dysentery over ten years. Attacks — infrequent. Last date of emetine intake about a year ago

TABLE 2—SHOWING LABORATORY REPORTS OF BLOOD AND STOOL AND RADIOLOGICAL FINDINGS BEFORE AND AFTER TREATMENT

Sl. No.	*Stool*	*W.B.C. count*	*R.B.C. per c.mm.*	*Hb. %*	*Barium Meal Skiagram after 5 hrs. (Before treatment)*	*Barium Enema Skiagram (Before treatment)*	*Treatment with Resochin (Dosage)*	*Barium Meal Skiagram, after 5 hrs. (After treatment)*	*Barium Enema Skiagram (After treatment)*	*Remarks*
1.	Few cysts of Entamoeba histolytica. Plenty hookworm ova	Total—10,000 per, cmm. Differential— Poly – 68% Lympho – 26% Mono – 2% Eosino – 4%	2,375,000	55	Pressure filling defect in the distal portion of the ascending colon (Fig. 1, *vide* Plate)	Not done	1 tab. T.D.S. —4 days, then, B.D.— —21 days. (Total 54 tabs.)	Ascending colon fills properly with barium meal. Absence of filling defect (Fig. 2, *vide* Plate)	Not done	Patient became afebrile on 4th day: Pain stopped on 7th day, lump considerably reduced on 16th day of treatment, disappeared on 20th day
2.	No cyst or vegetative form of Entamoeba histolytica could be seen	Total—18,000 per cmm. Differential— Poly – 88% Lympho – 12% Mono. – nil Eosino – nil	4,750,000	75	Pressure filling defect in distal part of ascending colon (Fig. 3, *vide* Plate)	Filling defect in distal part of ascending colon (Fig. 4, Plate)	Ditto	Pressure filling defect relieved. Ascending colon, filling up properly. (Figs. 5 and 6, *vide* Plate)	Ascending colon shows good barium filling (Fig. 7, *vide* Plate)	Patient became afebrile on 7th day; Pain ceased after 15 days; lump disappeared after 18 days
3.	Fair number of cysts of Entamoeba histolytica: vegetative forms—few	Total—10,000 per cmm. Differential— Poly – 76% Lympho – 24% Eosino – nil Mono. – nil	4,500,000	80	Not done	Filling defect in caecum (Fig. 8, *vide* Plate)	Ditto	Not done	Caecum filling up properly	Patient afebrile on 8th day: Pain completely stopped on 10th day, lump disappeared on 18th day. *N.B.*—The after-treatment x-ray plate could not be submitted for unavoidable reason

to be amoebic in origin just as its absence in a given case cannot rule out the possibility of an amoeboma. Similarly, too much reliance need not be placed on leucocyte count, since it presents a variable picture depending upon the degree and nature of secondary infection. An indirect way of arriving at a diagnosis is to give a therapeutic trial of a course of 12 grains of emetine. Disappearance of the lump with amelioration of symptoms will stand confirmatory to the diagnosis.

In our cases clinical possibility of amoeboma was thought of in the light of the above-mentioned considerations. As stated, not much reliance was placed on blood count or stool report; weightage was given to therapeutic response. Instead of emetine however, chloroquine diphosphate was given a trial in all these cases. A very satisfactory response in the first case led us to try it in the other two cases. This is, however, contrary to usual expectation, for it is known that after oral administration of chloroquine fairly rapid and almost complete absorption takes place from the intestine to raise the plasma concentration in 6-8 hours' time. Maximum concentration occurs in the liver and lungs. Further, clinical trials also have demonstrated that these drugs have least action on amoebic dysenteric states. In the face of these well-known facts therefore, the extremely satisfactory result of therapy with chloroquine, in our cases of intestinal amoeboma, appears to provide a riddle.

SUMMARY

Report of 3 cases of intestinal amoeboma is submitted herewith.

All these cases were treated with chloroquine diphosphate and the clinical response was extremely satisfactory.

ACKNOWLEDGMENT

Thanks are due to Dr. S. Pabi and Dr. S. Samaddar, radiologists and Drs. G. Chakravarti and A. Sen Gupta, pathologists for their valuable co-operation.

REFERENCES

CHAUDHURI, R. N. AND RAICHAUDHURI, M. N.—*Indian M. Gaz.*, **81**: 138, 1946.

OCHSNER, A. AND DEBAKEY, M.—*New Internat. Clin.*, **1**: 68, 1942 (Abstract, *Trop. Dis. Bull.*, **39**: 315).

REDDY, D. GOVINDA AND RANGAM, C. MOHAN.—*Ibid*, **81**: 463, 1946.

ALLERGIC TONSILLITIS

H. S. AMBWANI, M.B.B.S.,
Kanpur

H.A., a Hindu male, aged 27 years, was examined on 7-1-53 with the complaints of fever and difficulty in swallowing.

History—There was history of a severe attack of fever and swollen tonsils following the intake of honey 12 years back, which subsided in about 7 days. No specific treatment was taken at that time.

On this occasion he took a teaspoonful of honey from the right side of the mouth on the night of 6-1-53. No other history was given by him. His mother usually suffered from allergic rhinitis at the time of any seasonal change.

On Examination—The temperature was 101°F., pulse 97 per minute. The throat was purple red in colour. The depth of the colour was more marked on the right side. The right tonsil was about four times as much swollen as the left one. The mucous discharge, blackish in colour, coming from the throat was in fair abundance, and it was at times tinged with blood. All the other systems were normal. The total W.B.C. count was 8200 per cmm. with the differential count as follows: Poly—68 per cent, lympho—29 per cent, mono—1 per cent and cosino—2 per cent.

Course and Treatment—From 7-1-53 the patient was put on the usual treatment for congestion of the throat, sulphamezathine tablets 2, t.d.s., procaine penicillin 4 lacs daily, and penicillin spray to the throat. He was worse by night. There was no improvement till on 10-1-53, he remembered the previous history and connected the same with the incidence of having taken honey on the night of 6-1-53. The whole treatment was stopped on the morning of 10-1-53 and an antihistaminic drug (Antistine—Ciba, 2 c.c.) was administered intramuscularly in the afternoon. At 8 p.m. the temperature touched normal, the right tonsil began shrinking in size, the throat congestion improved and the mucous discharge lessened. The next morning the patient was feeling weak but was clinically found free from any signs.

CONCLUSIONS

The manifestations of allergy are yet to be explored fully but it is interesting to note the condition of the unilaterally prominent tonsillitis, caused by allergic phenomenon as such an incidence is infrequent in the literature.

The patient felt worse at night because of insufficiency of the supply of adrenaline—an antagonist to histamine—on account of the prominence of the parasympathetic control at that time.

SUMMARY

A case of tonsillitis caused by the ingestion of honey and treated successfully with an antihistaminic drug after the failure of other treatments, has been described.

ACKNOWLEDGMENT

I wish to thank Dr. H. N. Shivapuri, Dy. Director, M. & H. S. (S.I.), Kanpur, for his kind permission to publish this case note.

Fig. 1 (Case 1) — Pressure filling defect in the distal part of the ascending colon.

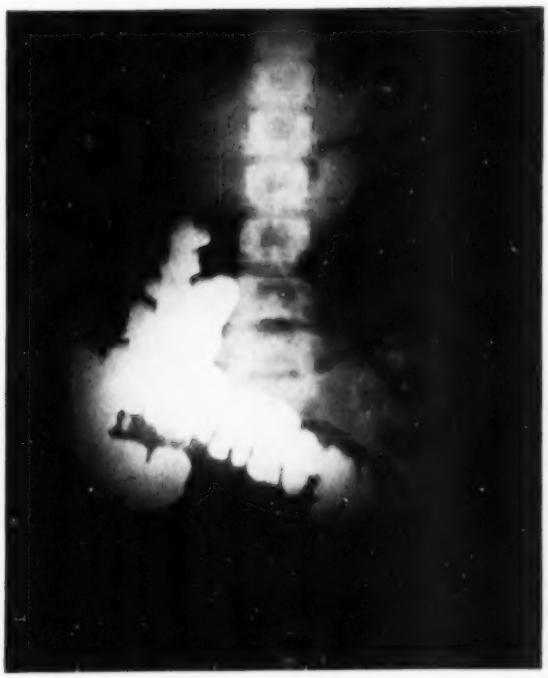

Fig. 2 (Case 1) — Ascending colon fills properly with barium meal. Absence of filling defect.

Fig. 3 (Case 2) — Pressure filling defect in distal part of ascending colon.

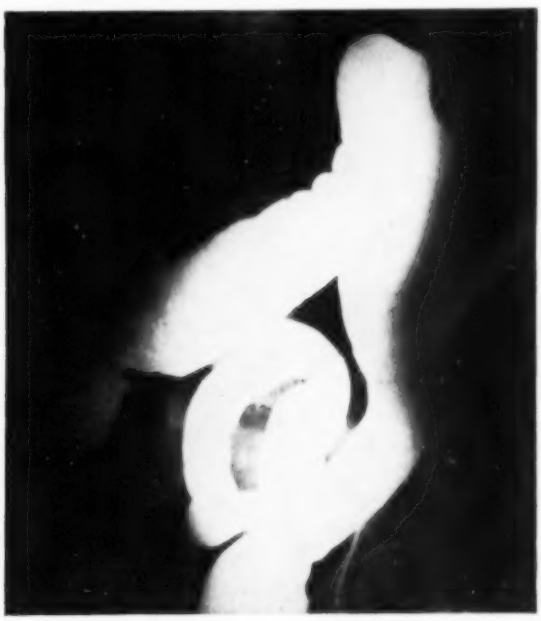

Fig. 4 (Case 2) — Filling defect in distal part of ascending colon.

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Fig. 5 (Case 2)—Pressure filling defect relieved. Ascending colon filling up properly.

Fig. 6 (Case 2)—Pressure filling defect relieved. Ascending colon filling up properly.

Fig. 7 (Case 2)—Ascending colon shows good barium filling.

Fig. 8 (Case 3)—Filling defect in caecum.

JOURNAL OF THE
INDIAN MEDICAL ASSOCIATION
CALCUTTA, NOVEMBER, 1953

FOURTH T. B. SEAL SALE CAMPAIGN

The second of October is a significant day in the life of the Indian nation. This day is celebrated throughout the length and breadth of the country as of special importance because on this date was born Mahatma Gandhi who brought in a complete re-orientation in the freedom movement by enlisting the sympathy of the masses of India and also evolved many beneficial schemes for the general uplift of the poor and neglected section of our people. As in the last three years, at the instance of the Tuberculosis Association of India with the blessings of the Union Health Minister Srimati Amrit Kaur, on this day this year also was inaugurated the fourth Tuberculosis Seal Sale Campaign.

It is indeed a very happy augury that all the States of India have joined in this campaign by making available to the people irrespective of their walks of life, the one anna T. B. Seal. This has been designed not only to get contributions but also to arouse consciousness amongst the people about the magnitude of the problem that faces us. It is no gainsaying the fact that the disease has of late spread out its tentacles in practically every direction and is causing miseries to millions of families by infecting persons mostly of the younger generations.

The number of beds that are available all over the country and also the number of clinics where patients can assemble to get succour fall far short of the needs. Against this background, to supplement the efforts of the various State Governments in the all-embracing programme of the Tuberculosis Association to tackle the disease, the co-operation of all right-thinking persons of the country is earnestly solicited by the sponsors of the movement. We add our appeal to make these Seals popular.

The disease, it is known to the readers of this periodical, is the outcome of over-crowding, malnutrition and the direct result of the rapid urbanisation of the rural population who to eke out their living are compelled to spread out in the industrial areas in conditions to which they were not used to. The abnormal rise in the country's population, the virtual lack of sufficient foodgrains and also the quality of their diet full of deficiencies, for the majority of our population, are contributory factors to the rather rapid dissemination of the disease. The disease even when detected in a person can hardly be tackled because of the want of facilities by way of modern treatment which is not available to every section of the community due to the abject poverty of the people and also the paucity of really qualified personnel who can take charge all over. It will probably take a long number of years to get beds for all the victims of this disease to keep them in segregation and thus prevent its spread to other persons of the same family. Till then it has got to be considered by the workers of the Tuberculosis Association and the agencies of the Government in the field of medical and public health whether scope for domiciliary treatment could be enlarged with a view to helping in the arrest of the disease which if done at the right time will, we are confident, check the progress of the disease not only in the patients themselves but also prevent infection of other inmates of the family who come in contact with the patients.

On the 2nd of October 1953 the Fourth T. B. Seal Sale day was observed with due solemnity. The President of the Indian Republic Dr. Rajendra Prasad has in a few well chosen words appealed to our countrymen to help in the success of this Seal Sale Campaign so that the funds that are raised can be utilised in rendering assistance, financial as well as expert, to the patients whose number to-day is legion. The Union Health Minister in her broadcast talk from All-India Radio, New Delhi, has also reiterated her previous statements on the mobilisation of the available resources of the people and the Government in preparing for a frontal attack on this disease which is every day sapping the vitals of the nation.

We take this opportunity to appeal to all members of the medical profession and also the constituent branches of the Indian Medical Association to do their best to fall in line with the wishes of the President and the Union Health Minister in mobilising public opinion in making the Seal Sale Campaign an all-round success. We feel that any effort made in this direction will go a long way not only in mitigating the sufferings of the afflicted persons to a great extent but also in rousing up consciousness amongst the public about the magnitude of the problem that is facing us. Any help however small will be appreciated by all concerned as tuberculosis has become a subject matter of vital national importance. We are so overwhelmed by the immensity of the problem that we make this fervent and earnest appeal to every one of our readers wherever they are placed to do his or her best to make this movement a success it so richly deserves.

XXX ALL-INDIA MEDICAL CONFERENCE, HYDERABAD

The XXX All-India Medical Conference will be held at Hyderabad on the 27th, 28th and 29th December, 1953. Dr. S. C. Sen will preside.

The Working Committee of the I.M.A. will meet on the 24th December and the Central Council on the 25th and 26th December, 1953.

CURRENT TOPIC

ADVICE TO NEW ENTRANTS TO THE MEDICAL PROFESSION*

B. N. GHOSH, M.B.E., F.R.F.P.S., F.R.S.,
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It is with great pleasure that I take this opportunity afforded to me to welcome you as new entrants to this noble profession. I congratulate you on your choice of this calling which offers a combination of intellectual and moral interests found in no other profession, and not met with at all in the common pursuits of life—a combination which offers the most complete and constant union of the qualities which have the greatest charm for pure and active minds, namely, to do good to humanity, utility and charity.

While I welcome you with the realisation that one day you will be also one of the profession, my memory goes back fifty years when I as a young student entered the medical college. We were asked to observe three things by the then Principal of the College. First to attend the college properly dressed. Excepting those who used to attend in coat and trousers, we were all asked to come to the college in dhoties and coat and socks and shoes. We were not allowed to enter the class or hospital in shirts and slippers, or with chadders. Secondly, we are compelled to be punctual in our attendance either in the class or the hospital. Thirdly, we were asked to show respects to our teachers and professors by wishing them "Good morning, sir". So far as I can recollect we all agreed to follow these directives without any murmur. My object in mentioning this is to show how things have changed and how different is the general atmosphere now. At present there is no uniformity in dress every one dresses according to his own choice. Uniformity in dress has the advantage of recognising each other as belonging to the same guild. Apart from colour, all Europeans are known by their dress, so are all Burmese, Chinese, and so forth. I often ask myself why not all medical students or for that matter medical men adopt some uniform dress.

I am sorry to observe that in the present context respect for seniors or teachers is fast disappearing. Personally, I have little to complain, I am perhaps fortunate and as a rule received courteous behaviour from my students but I can say that this show of respect by students as a class has not been universal. When climbing up the steps or coming down you often feel being pushed by some of the overzealous students. I am fully conscious of the fact that one cannot force any one to respect you, it must come spontaneously. At the same time both teachers and professors should also be able to command respect not by compulsion but by their behaviour and love to the students.

I shall now deal with some of the influences which will go a long way to mould your character as students not only during the days of your pupilage but hereafter when you enter upon the more serious duties of life. In the first place try to cultivate the art of detachment. By this I mean the faculty of isolating yourself as far as possible from the extra academic activities which unfortunately are too much in evidence at present, and other pursuits and pleasures incidental to youth. The discipline necessary to secure this art of keeping yourself aloof from such activities bring in its train habits of self-control and realisation of the sterner realities of life. Other qualities which you will have to cultivate are to be methodical and thorough. These qualities, namely, the art of detachment, virtue of being methodical and quality of thoroughness, will go a long way to shape your character as students in the true sense of the word, as successful practitioners, or even as investigators or research workers. Above all cultivate humility. In these days of aggressive self-assertion, when competition is keen and the desire to make the most oneself so universal, one may think it rather old-fashioned to preach the necessity of this virtue of humility, but I am old-fashioned in certain respects.

Since you have joined this college by preference it is proper that you should have some idea regarding the origin and tradition of this institution as against similar other such colleges. This college is an embodiment of what selfless devotion can do. Some of the pioneers of the profession by their love for the science made this institution what it is to-day. And the name of R. G. Kar will always be remembered with reverence and gratitude as being the one who with a humble beginning was able to make this institution which is now a pride of the nation. The past is always with us never to be forgotten. Amidst the changes which succeed one another so rapidly in this life we are liable to live too much for the present and too much for the future. On such an occasion as the present, I cannot resist the temptation to hark back to the olden days and gratefully recall the men whose labours in the past have made the present possible. It is not the building and pump of an institution, although these are necessary, which bring honour, nor its wealth, nor the students who throng the halls, but the men who had trodden in its service the thorny road, through toil, even through many obstacles, to the serene abode of fame. It should thrill the heart of every well-wisher and every teacher, as it does mine to-day who had the privilege to work with some of those pioneers, reverently and thankfully to recall such names as R. G. Kar, Sir Nilratan Sircar, Col. S. P. Sarbadhicari, M. N. Banerji, and such men amongst their successors as Sir Kedar Nath Das, Sir Upendranath Brahmachari, Narendra Nath Basu, Pramatha Nath Nandi.

In this context I am reminded of the few lines composed by Dr. Rabindranath Tagore on the death of C. R. Das—

Enechile sâthe kare mṛytuhin praṇ
Maraṇe tâhâi tumi kare gele dân

All these great men, though dead have left a legacy of their sacred works in this college and every brick of this institution bears testimony.

All these great men of the profession are no more with us, but their lives are an example to us—

"Lives of great men all remind us,
We can make our life sublime,
And, departing, leave behind us
Foot prints on the sands of time".

Let the foot prints of these departed of whom we are so very proud guide us to uphold the dignity and tradition of the institution they built up with their life blood for imparting medical education and medical relief.

Signs are however not wanting that some of the old alumni of this institution have followed the foot prints and are holding responsible positions in this very college and ungrudgingly giving their best for the benefit of the institu-

*Inaugural address delivered to new entrants to the R. G. Kar Medical College, Calcutta in 1953.

tion. We are all proud of them. We appreciate their devotion and spirit of sacrifie to their alma mater. I have no doubt that some of you buoys who have just entered this institution will maintain and uphold the tradition and will one day occupy responsible positions and lead the college onwards.

A few words regarding the profession which you are about to enter. Health, ease and prolongation of life are the three objects for which the aid of the physician was sought from the earliest history of mankind. Health is not merely absence of disease, the conception of health envisages a full development of physical, mental and spiritual powers with which an individual is endowed. In the earliest endeavours to explain and combat disease, disturbance of health was attributed to supernatural agencies, to dietetics and demons, to obscure occult influences exercised by stars, fairies and witches, and the restoration of health was sought by means of prayers and sacrifices, conjuration and exorcism, charms and spells. With the progress of our knowledge in biology, bacteriology, and other allied branches of the science our conception of disease has changed; and since life is governed by biological laws, it is only by investigation and knowledge of life's laws that we can hope to combat or avert the phenomena resulting from the interplay of certain universal biological processes which we call disease. To understand disease and to be able to deal with it you must have a good knowledge of chemistry, physics and biology as your fundamental background and on this you can build up further structure with your knowledge and study of anatomy, physiology, bacteriology and pathology to enable you to understand the causation of disease and treat the same rationally with your knowledge of pharmacology. You can well understand that to attain this ideal you must have a wide substratum of knowledge.

Medical science has made phenomenal progress within recent years and with the advance of our knowledge in bacteriology and other allied branches we are able to make diagnosis and treatment more accurately. At present more attention is paid to theoretical teaching and laboratory findings than to clinical observations. In a country like India, where facilities for laboratory and other aids to diagnosis are not always available except in a few large towns and cities, and even where such facilities are available they are beyond the means of the large bulk of the people, it is essential that you should get yourself well trained in clinical diagnosis. While every effort should be made for the scientific method of approach this aspect should not be forgotten. Remember didactic lectures are only preparatory and these should be supplemented by clinical observation. You hear of description of malaria fever or pneumonia or typhoid fever in the class room but these are of little value unless and until you try to fit in your knowledge so gained in actual cases at the bedside. This holds good in every branch of medical science. Similarly, you learn in the class room, say, how digitalis acts on the heart, at the bedside you see the practical application of this knowledge in the treatment of congestive heart failure. God has given you eyes to see, ears to hear and sense of touch. Devote more time in the wards and study cases and see how the signs and symptoms which you actually observe are in conformity with what you learnt in the books or in the class rooms.

You will have ample opportunities offered to you for learning and make use of them to the full extent in the class room, laboratory and wards. Do not blame your teachers or examiners for failure, but search your heart and try to find out who is responsible for failure, the teacher, the examiner or yourself.

In the days of your probation you have little to worry excepting your study and examination, but the difficulties will arise after the break which will follow after you leave the college. If your aspiration is only to possess a degree, you will no doubt rejoice to attain the freedom from unpleasant studies and heave a sigh of relief and possibly along with your books you will throw away all thoughts of further study. On the other hand, some of you will think that there is still much to be learnt and will realise that what you learnt in your collegiate period was only the beginning of the student life.

Some of you will perhaps settle in rural practice, some who can afford will settle in towns and cities and a few perhaps will devote to teahing and research. It is possible to manufacture any number of medical practitioners, in five years or longer, but one cannot manufacture research workers at will, nor teachers or professors in specialised subjects. These require special training, culture and aptitude. Those who are at the helm of the profession now are not immortal and their place will have to be taken by some of you. What is wanted by our young men is not simply knowledge but wisdom. For as the poet said—

"Knowledge is proud that he has learned so much;
Wisdom is humble that he knows no more"

Remember all discoveries both in medical science and also in other spheres were chance discoveries. Every one saw apples falling but it was left to Newton to elucidate the law of gravitation. Likewise it was the experience of most bacteriologists how cultures of bacteria were often inhibited when contaminated with some fungal growth or air bacteria; but it was left to Fleming to enquire why this happens and thus led to the epoch-making discovery of penicillin.

This reminds me of a few lines of Tennyson among others, he says—

"Why are we born and why do we die;
Why do we laugh and why do we cry
Who will riddle me the how and the why"

Never take anything for granted, always ask yourself the how and the why.

To each one of you the practice of medicine will be very much as you make it. You can make it nobler or make a high and sacred calling a sordid business and thus falsify the best tradition of an ancient and honourable guild. It may be to some full of worry and perpetual annoyance; to another, a daily joy and a life of as much happiness and usefulness to mankind as can fall to the lot of men. You can best fulfil the high mission of our noble calling—in its humility, conscious of weakness, while seeking strength; in his confidence, knowing the power, while recognising the limitations of his art; in his pride in the glorious heritage from which the greatest gifts to man have been derived; and in the hope that the future holds for us still richer blessings than the past.

I will now conclude with the following lines of Emerson:

"Life is too short to waste,
In critic peep or cynic bark,
Quarrel or reprimand;
'Twill soon be dark;
Up mind thine own aim, and
God speed the mark".

REFERENCE

OSLER WILLIAM—Aequanimitus and other Addresses.

NOTES AND NEWS

SANITATION IN RURAL AREAS

The third session of the WHO Expert Committee on environmental hygiene and sanitation was held in August at the Palais des Nations, Geneva, under the chairmanship of Dr. George MacDonald, of London.

During this session, the experts studied problems of everyday life, particularly in the countryside where sanitary conditions "are not always as rosy as fresh air and sunshine might lead one to believe".

It is estimated that the globe has 2,30,000,000 inhabitants, of which two-thirds, i.e., 1,500,000,000, live in rural areas. By far the greater part of the world's rural populations live in conditions that are precarious, to say the least. It is with their lives and problems that the WHO experts concerned themselves. It should not be thought that unsatisfactory conditions exist only in under-developed regions.

In *India*, the number of deaths due to lack of hygiene in one year have been estimated as follows: Cholera—200,000; dysentery and diarrhoea—220,000; typhoid and other fevers—3,300,000.

The annual cost of typhoid fever, diarrhoea and enteritis for 100,000 inhabitants has been estimated at $58,265. On the other hand, the installation of proper water supplies and sewage systems for the same population would cost $138,000. It would thus appear that the savings to be derived from the reduction of disease would pay off the cost of sanitation in the short span of three years.

WHO CONFERENCE ON MALARIA IN BANGKOK

The First Asian Conference on Malaria ended on 24th September 1953 with a note of measured optimism that malaria can be eliminated within a matter of years from areas where one quarter of world's population lives.

The results of this historic four-day conference which comprised fifty delegates from some twenty nations held under the auspices of the World Health Organization were adopted in the final plenary meeting in Bangkok's new "Hall of Peace". The keynote of this summary report is struck by the quotation of a statement by Dr. Paul F. Russel, of the Rockefeller Foundation, one of the World's foremost malariologists and former chairman of WHO's Expert Committee on Malaria that "No country with a serious problem of malaria can afford *not* to control this disease".

The conference adopted a number of recommendations which will be circulated to all the participating governments. These call *inter alia* for a strong and permanent malaria control organization in every country where this disease is a major public health problem and for maximum co-ordination of effort on an inter-country, intra-regional, and eventually on inter-regional basis with WHO'S assistance as a clearing-house and a focal point.

SIR CHARLES HASTINGS ESSAY COMPETITION

The British Medical Association invites essays from any member of the B.M.A. in India engaged in general practice, for the above competition. The following are the regulations governing the awards:

The work submitted must include personal observations and experiences collected by the candidate in general practice, and a high order of excellence will be required. Candidates in their entries should confine their attention to their own observations in practice rather than to comments on previously published work on the subject, though reference to current literature should not be omitted when it bears directly on their results, their interpretations, and their conclusions.

Essays, or whatever form the candidate desires his work to take, also inquiries relative to the prizes should be addressed to the Secretary, British Medical Association, B. M. A. House, Tavistock Square, London, W.C.1, not later than December 31st, 1953.

A prizewinner in any year is eligible for an award of either of the prizes (mentioned below) in any subsequent year. A study or essay that has been published in the medical press or elsewhere will not be considered eligible for a prize, and a contribution offered in one year cannot be accepted in any subsequent year unless it includes evidence of further work.

Preliminary notice of entry for this competition is required, on a form of application to be obtained from the Secretary.

Each essay, which should be unsigned, must be typewritten or printed and accompanied by a note of the candidate's name and address.

No definite limits are laid down as to the length of essays, but the Council anticipates that for this competition essays should consist of between 3,000 and 10,000 words.

The Sir Charles Hastings Clinical Prize, consisting of a certificate and 50 guineas, will be awarded for the best essay submitted.

The Charles Oliver Hawthorne Clinical Prize, consisting of a certificate and 40 guineas, will be awarded for the second best essay submitted.

UNICEF VOTES FURTHER AID TO INDIA

The Executive Board of the United Nations International Children's Emergency Fund (UNICEF) in New York has voted further substantial aid to India, Afghanistan and Ceylon totalling U.S. $1,044,000.

The funds voted will be used mainly for the continuation and expansion of the present programmes of assistance to Maternal and Child Health, but there is also money for new programmes which were planned in the first half of this year, one of which is the first of its kind in Asia.

This is the proposal to assist the Government of Bombay with their Milk Conservation Programme in Greater Bombay, using milk from the Kaira Dairy Co-operative at Anand and from the Government Milk Colony at Aarey.

The purpose of the UNICEF provision is to ensure an increased supply of safe milk at a cheaper rate, and the utilization of the full output of the Anand area during both flush and normal periods of milk yield, so that it may be used for feeding without wastage or diversion. To this end the skim milk-powder production plant, will convert seasonal surpluses of milk into powder by the spray drying process, yielding milk in a form which can be satisfactorily packed and stored for comparatively long periods until it is required eventually to supplement local demand. The cold storage and bottling equipment will augment existing apparatus and will enable a large quantity of milk to be handled, with a high level of bacteriological purity.

A sum of U.S. $104,000 has been voted for assistance in development of Maternal and Child Health Services and training in Travancore/Cochin State. Proposals have been

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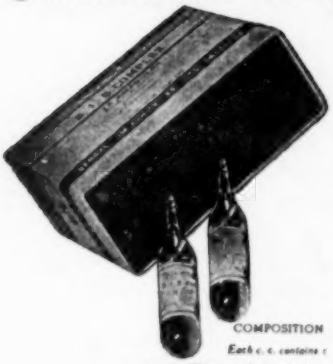

COMPOSITION
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Vit. B_6 (Pyridoxine Hydrochlor)	...	1 mg.
Nicotinamide	...	50 mg.
Calcium Pantothenate	...	4 mg.

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Vitamin B_6 (Pyridoxine)	...	1 mg.
Nicotinamide	...	15 mg.
Calcium Pantothenate	...	3 mg.
Sodium Glycerophosphate	...	gr. 4
Potassium Glycerophosphate	...	gr. 4
Calcium Glycerophosphate	...	gr. 4
Strychnine Glycerophosphate	...	gr. 1/60
Manganese Glycerophosphate	...	gr. 1
Lecithin	...	gr. 1/2
Alcohol as preservative	...	12% by vol.

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drafted as a result of the co-operation of State Government and Central Government Medical Advisers and doctors of the World Health Organization for improving existing facilities in the State, and UNICEF will provide the necessary imported supplies and equipment for this programme which is planned to extend over the next three years.

Similar State projects in Hyderabad, Uttar Pradesh, Bihar and West Bengal are already being assisted by UNICEF, and this type of aid marks a departure from the previous procedure when assistance was given on an individual basis to institutions and hospitals, in programmes which were spread throughout the country and were often unrelated to any State-wide effort.

OTHER PROGRAMMES IN INDIA TO BENEFIT

The following existing programmes in India will receive additional aid following the UNICEF vote of funds:

		U.S. $
1.	Ski 12,800,000 lbs. of Skim Milk for feeding Mothers and Children in famine and distressed areas, and through hospitals and institutions	128,000·00
2.	Emergency Drugs for distress and flood areas	14,000·00
3.	Provision of Drugs and Diet Supplements to Mother and Child Health Centres, and expansion of Nurses and Midwives training ...	331,000·00
4.	Continuation and expansion of National Mass BCG Vaccination Programme ...	140,000·00

THE DEAF SUPERIOR IN NOISY JOBS

Persons with impaired hearing who have no abnormal sensitivity to noise and are properly selected may be excellent workers in very noisy occupations and surroundings. Provided they are not affected by the noise, they can concentrate better and generally suffer less nervous strain than persons with normal hearing.

This fact is contained in a series of notes prepared by the International Labour Organisation for the United Nations and Specialised Agencies Working Party on the Rehabilitation of the Physically Handicapped at New York.

CORRESPONDENCE

The Editor is not responsible for any views expressed by the contributors

PENICILLIN ALLERGY

SIR,—In view of the very wide and general use of antibiotics these days, especially that of penicillin, one should be aware of the various forms of reaction occurring after its use.

Such reactions may be mild and easily got over on discontinuing further injections or, on the other hand, such a reaction may be very formidable, endangering life, and in some cases may be even responsible for immediate death from it.

Amongst the milder forms of reactions met with, may be mentioned skin rash of a maculopapular type or of urticarial nature, fever, vomiting, oedema of the angioneurotic type over lips and face.

Of the latter class—acute anaphylactoid type of reaction has been reported in a few cases.

The following case illustrates an acute anaphylactoid reaction occurring soon after a penicillin injection in an infant seven months old.

Baby, M.M., 7 months, one of twin brothers, developed a mild temperature with slight cough and running from the nose, on 29-4-53. By evening the temperature rose to 103°. The child was not very ill and showed no obvious throat or lung signs. However, a throat swab was taken, which on being reported to contain large number of pneumococci, it was decided to inject penicillin. And hence Procaine Penicillin 100,000 units was injected at 9 p.m.

On the next day (30-4-53) as fever continued at 101°, Crystalline Penicillin 60,000 units was injected at about 9 a.m.

Throughout the day, albeit the fever, the child was quite bright and took his feeds well, and was said by the mother to have taken a feed at 3 p.m. grasping at the bottle with both hands (indicating a bright condition of the child).

At 4 p.m. a further injection of 60,000 units of Crystalline Penicillin was given, and within a few minutes, the child suddenly became cold and blue, stopped breathing, and began to have twitchings of the face muscles, which were followed by generalised convulsions. Artificial respiration was immediately given and continued till oxygen arrived, ½ c.c. of Coramine was injected.

As soon as oxygen was started, cyanosis became less but did not dissapear completely, and the child began to breathe.

I saw the child at 6 p.m. about 2 hours after the onset of the acute episode. The infant was slightly cyanosed, skin was cold and moist, respirations were about 5 to 6 per minute, heart rate was very rapid with an imperceptible pulse.

Both lungs were full of bubbling rales from pulmonary oedema.

These findings and the history of their sudden and dramatic onset within 10 to 15 minutes of the penicillin injection, left little room for doubt in my mind of any other condition but that of anaphylaxis.

An injection of 1/400 gr. atropine and 5 m. adrenalin was given (and oxygen continued through a nasal catheter). Cyanosis was very slightly lessened and the breathing also improved to a very slight extent. From then onwards, injections of ½ c.c. antistine and 5 m. adrenalin were given every 4 hours together with continuous oyygen through a nasal catheter.

BENGAL PROVINCIAL MEDICAL CONFERENCE

The XIII Bengal Provincial Medical Conference will be held at Midnapore on November 7 and 8, 1953.

PUNJAB PROVINCIAL MEDICAL CONFERENCE

The XXIII Punjab Provincial Medical Conference will be held at Jagadhri (Ambala) on November 28 and 29, 1953 under the presidentship of Dr. Sain Dass Vohra.

The child rallied by midnight and by the next morning the condition was greatly improved and he tided over the crisis.

However, fever continued to persist between 100° and 102° for the next two days without any definite and localising signs in the lungs or elsewhere.

I had the child brought for screening, which revealed a homogenous opacity of mild density of the entire middle and lower lobes of the right lung.

Considering it to be rather suggestive of primary pneumonia I advised Terramycin Elixir, which helped to remove the temperature, ending in complete recovery. I am, etc.,

Poona. M. S. H. MODY.

CONTROVERSY ON NON-RADIOLOGISTS OWNING AND OPERATING X-RAY UNITS

SIR,—A good general practitioner when he takes up a case earnestly, will go into the history of the case fully, examine him clinically, then make the common laboratory tests of his urine, excreta, blood, sputum, etc., with his own equipment. He follows the case and keeps his mind open even while empirically treating him till he clinches the diagnosis before the patient recovers or dies. While handling his cases, he is aware of his own limitations in knowledge and ability in specialist-fields, and he is aware of the fallacies in the various simple tests and investigations he makes. Often he finds himself wiser for sticking to his clinical diagnosis when his laboratory differs from him. What is the fault of such a practitioner owning a portable x-ray unit annd examining, by fluoroscopy and radiography, his own cases by way of additional investigation? Of course, he will familiarize himself with the common pitfalls in interpretation of skiagrams. He will guide himself with such useful and instructive books, like Clark's "Positioning in Radiography", "Diagnostic Radiology" by British authors, and one or other of the fine text books on diagnostic and therapeutic radiology, meant for students and general practitioners.

I cannot quite understand the psychology of the specialists in radiology who objejct to the general practitioners (I mean a non-radiologist doctor) possessing a small x-ray apparatus and using it to get whatever more light he can out of it about his own cases. No doubt, an experienced radiologist draws more information and more correct information; but that is no reason to ban a non-radiologist practitioner from exercising his privilege of possessing this additional dianostic aid for the benefit of his own patients. It is like a cardiologist banning a general practitioner from auscultating a patient's heart with a binaural stethoscope on the ground that a general practitioner cannot understand those heart beats as well as a cardiologist.

Next, I note that they want to frighten us about the harmful nature of x-rays. Well, we doctors are exposed to graver risks every minute when we are handling patients suffering from highly infectious diseases against some of which we have no real protection at all. Even service in war, where the doctor is not protected altogether, was sought by us eagerly.

So I wish our radiologist colleagues would take a broader view and help general practitioners owning x-ray units to improve their knowledge in radiology and benefit their patients by the use of the x-ray units they possess and not discourage them; much less should they press the Government to ban posession of such units by general practitioners.

I own a small x-ray unit in my clinic and I am operating it for one year. I am happy and proud of it. I am, etc.,

Sitapati Clinic, Tekkali, Srikakulam Dist. M. V. RAMA RAO, M.B., B.S.

INSURANCE EXAMINATION FEES

SIR,—There is no doubt that our Association is always ready to uphold the honour and prestige of our profession but have we no duty to perform individually to uphold our own honour and prestige? Is there any compulsion for any doctor to examine cases for those Insurance Companies who do not pay them adequate fees? Do not the doctors themselves agree to accept the lower fees from such companies before they are allowed to examine cases for them. The remedy, I submit, lies in our own hands. We as individuals raise or lower our own intrinsic values by our own conduct. In August issue on page 477 it is stated that the association should take up the question of fees with the Insurance Companies, etc. What would be the position of our Association if our brethren would still examine cases at ludicrously low fees? Let us learn to be more dignified and not bother the parent body to demand respect for us. I am, etc.,

Ghazipur, U.P. TRILOK NATH DUTTA, M.B.B.S., *Medical Practitioner.*

D.T.M. EXAMINATION AND THE MEDICAL LICENTIATES

SIR,—It is now known that the D.T.M. course (now D.T.M. & H.) of the Calcutta School of Tropical Medicine has been affiliated to the University of Calcutta from 1953-54 session, and that the duration of the course has been extended from six to nine months.

According to the rules of the Calcutta University, medical licentiates will no more be eligible to sit for this examination.

D.T.M. course was the only post-graduate course open to the licentiates, and now the University has abruptly shut its doors on the face of this class of doctors.

The medical licentiates had so long been eligible to sit for the D.T.M. examination under the Faculty of Tropical Medicine and Hygiene, and the results of examinations amongst the licentiates had been quite satisfactory. The reason is not known why the University has decided to debar the licentiates from undergoing this course of study.

Our association, the Indian Medical Association, should take up this matter with the authorities of the Calcutta University and urge upon them to revise the rules so that the medical licentiates are granted eligibility to sit for this examination. I am, etc.,

Neora, Jalpaiguri. S. N. DAS, L.M.F., D.T.M.,

REVIEWS

DISEASE AND ITS CONQUEST, G. T. Hollis, Hon. M.A. (OXON.); Foreword by Maurice Davidson, M.A., M.D., B.CH. (OXON.); F.R.C.P. (LOND.); First edition; Crown 8vo, pp. 163+viii; Oxford University Press; Price 9s. 6d.

The ordinary man knows perhaps more about the atom bomb than his own body. One of the reasons is that there are few books that deal with medical subjects written for

the layman.' The small volume reviewed is especially written to fill this gap. It supplies reliable answers to many questions about some sixty diseases. The causes which produce these diseases, the principles by which they are diagnosed and the methods of treatment are all there. The layman is sure to profit by this volume.

The reviewer found a loose statement: "Malaria cannot be passed directly from one person to another; no one can acquire it without being bitten by an infected mosquito" (p. 43). Surely malaria can be transmitted by, for instance, blood transfusion.

DIAGNOSTIC TESTS IN NEUROLOGY—R. Wartenberg. The Year Book Publishers, Chicago, pp. 228, $4·5.

This small useful handbook does not claim to be a substitute for a book on clinical examination of the nervous system. It contains the author's own selection of certain tests which he has found valuable in his long experience as a clinician and as a research worker in neurology.

In the introduction he has stressed the necessity of a thorough clinical examination which may save the patient many unnecessary investigations and he quotes Cushing's warning "We have instruments of precision in increasing numbers with which we and our hospital assistants at untold expense make tests and take observations—the vast majority of which are but supplementary to and as nothing compared with, the careful study of the patient by a keen observer using his eyes and ears and fingers and a few simple tests". Dr. Wartenberg's attempt is to increase the number of these simple tests and to enlist valuable clinical information from these.

In the book one meets with tests which are not included in the usual treatises on neurology. The rationale of the tests are not given but one can guess the physiological principles on which the tests are based. The method of examination for each test is reasonably detailed, and often illustrated. If all the tests are proved of value, then they would surely be of great help in building up the diagnosis in atypical cases. The author has to be congratulated on his clinical originality. As an additional book on neurology it should prove useful to practitioners and neurologists.

PROSTATECTOMY: A METHOD AND ITS MANAGEMENT—By Charles Wells, Professor of Surgery, The University of Liverpool 1952. Pp. 103 with 72 illustrations. E. & S. Livingstone Ltd., Edinburgh & London. Price 24s. net; postage extra.

Non-malignant prostatic obstruction may be due to a benign senile enlargement, a small fibrous prostate or Marion's disease. Of these the first condition is of course the commonest, for which various types of treatment and several operative techniques have been advocated at different times. Following the outstanding work of Mr. Wilson Hey, the Professorial Unit in Liverpool accepted the proposition that, in retention, the optimal time for operation is when the patient is first seen. With this background Prof Wells' unit has adopted and routinely practised the operation of suprapubic prostatectomy with hæmostasis and closure of the bladder. This book describes the operation as they practise it in the Professorial Unit, with the after-treatment appropriate to different types of cases and other relevant data concerning the operation and the results of the same. One chapter devoted to an analysis of 205 consecutive admissions is very instructive, as also the last one on 'late results'. This monograph should be read by all surgeons who intend doing 'prostate surgery' along with other works or exclusively.

ARCHITECTURAL PRINCIPLES IN ARTHRODESIS—By H. A. Brittain, with a foreword by Sir Harry Platt. Second Edition, 1952, with 257 illustrations, nine in full colour. Pp. 196. E. & S. Livingstone Ltd. Edinburgh & London. Price 42s. net; postage extra.

This is a welcome second edition, after ten years, of the well-known monograph by Mr. Brittain. The book puts forth the results of careful consideration and suitable planning with the extensive operative experience and skill of the author. The author favours the lateral approach for ischiofemoral arthrodesis as he has found this easier than the more conventional posterior approach. He describes a new operation for fusion of the hip in osteo-arthritis which dispenses with immobilisation in a plaster cast. Naughton Dunn's operation for stabilisation of the foot has been specially included in the appendix—thus adding to the usefulness of this very valuable book. Paper, printing, reproduction of the sketches and figures (black and white or multicoloured) and binding are all very good. The book makes pleasant reading and will prove useful to all interested in the subject.

INDIAN JOURNAL OF ANAESTHESIA. (Journal of the Indian Society of Anaesthetists). Editor—Dr. M. C. Ganguli, M.B., B.S., D.A.(ENG.). Vol. I., No. 1, July 1953. Editorial Office—5/1, Amherst Street, Calcutta. Published annually, single copy Rs. 2/8/-.

The Indian Society of Anaesthetists was started in 1949 with only a group of sixteen members, which has since risen considerably. They have had four annual conferences till 1952 when it was decided to start a journal of their own. This inaugural issue of the journal mainly comprises of the papers transacted at their Fourth Annual Conference held at Vellore (S. India) in December, 1952. There are a few interesting articles based on the experience of the authors drawn from various parts of the country. One article on "Dilute Drip Pentothal in Porolonged Anaesthesia" and another on "Intravenous Procaine Anaesthesia" appear to be of special interest specially in view of the number and variations in the nature of studies reported in these articles. Paper, printing, typography and get up are commendable, considering this to be the very first issue of the Journal. We wish long, useful and buoyant life to this new venture.

A TEXT-BOOK ON MEDICAL JURISPRUDENCE & TOXICOLOGY—By J. P. Modi, L.R.C.P. & S. (EDIN.), L.R.F.P.S. (GLASGOW), formerly Professor of Medical Jurisprudence, King George's Medical College Lucknow. Eleventh Edition, 1952; with 3 plates (2 coloured) and one hundred and eighty-nine illustrations. Pp. 758 plus 22 pages index. N. M. Tripathi Ltd., Princess Street, Bombay 2. Price Rs. 24/-.

We have already commented on the previous edition and we reiterate our opinion that this is a standard text book on forensic medicine in India—only of its kind—by an eminent specialist who has spent his whole life for the advancement and dissemination of this fascinating science in our country, although unfortunately the case for forensic medicine is considered a small one by some standards.

The book contains every thing what students, practitioners and members of the legal profession want to know from forensic or toxicological standpoints. The chapters on

intersex and sexual offences are particularly good and those on Indian Vegetable Poisons are not only very interesting but also form an important contribution to toxicology.

We can recommend the work as one of the best—if not the best—text book on this subject in India and it will be found to meet every need of the medical students, or the medicologists in Government Service in the mortuaries of the remotest districts who need guidance in medicolegal cases.

JOURNAL OF THE GUJARAT RESEARCH SOCIETY; Vol. XV, No. 2, April 1953. Published by the Hony. General Secretary, Gujarat Research Society, 46-48, Esplanade Mansion, Mahatma Gandhi Road, Bombay 1. Published quarterly. Annual subscription Rs. 6/. Single copy Re. 3/-.

The Gujarat Research Society was formed sometime back and is at present registered under the Charitable Societies Act XXI of 1880. It has quite laudable objects with activities limited to the territory of Gujarat including Saurastra, Cutch and other outlying areas. The present issue contains two important articles by P. G. Shah; one on "Health Planning for Non-Industrial Workers" and another on "The Family as the Unit of Social and Health Surveys". The first is mainly a collection of valuable material from various foreign sources, and is a thought-provoking one, particularly at the present time when the Government of India and other authorities are beginning to look after the interests of the industrial worker (through the Employees State Insurance Corporation) while the non-industrial worker seems to be left and fend for himself. The second is a well-written article containing valuable data some of which have been worked out through the efforts of the Gujarat Research Society. The Annual Report in the accounts, however, reveal a sad state of affairs for, more than one-third of the total turnover is shown as "Excess of Expenditure over Income."

OBITUARY

DR. CHARU CHANDRA BASU

We deeply regret the passing away of another illustrious top-ranking leader of the medical profession. Dr. Charu Chandra Basu was one of the foremost pathologists and bacteriologists of India. Till the moment of his death, he was an Emeritus Professor of these two subjects of the first non-official Medical College in India, namely, the R. G. Kar Medical College, Calcutta. He was held in very high esteem by his confrères in the medical profession who used to go to him for expert opinion on subjects in his line. He was 71. He was connected with the Indian Medical Association as President of the Bengal Provincial Branch and as a member of the Journal Committee and was for some time Assistant Editor of this journal. A quiet silent worker with a philosophical trend of mind, he always avoided claptraps even when there was sufficient urge for the same. All through his life he devoted himself to the work in the laboratory. In the latter part of his life he was connected with Bengal Chemical and Pharmaceutical Works Ltd., Calcutta, as its expert in the Biological Department. We feel his loss as a personal one and offer our sincerest condolence to the members of the bereaved family.

DR. CHARU CHANDRA BASU

DR. (MISS) J. GRANT

Dr. (Miss) J. Grant of Seoni branch, I.M.A. passed away suddenly on the 6th June 1953 as a result of an accident.

Born in Inverness in Scotland on 31st January 1874, she got her M.B. Ch.B. from the Glasgow University. She practised for a short period in Kilsyth near Glasgow.

She came to India in 1901 and got an appointment in U.C.S. Church Mission Hospital, Seoni, M.P.

Her work was so much appreciated by the medical practitioners of Seoni that she was elected president of the Seoni branch in 1949. In recognition of her services to the suffering humanity, she was awarded a Silver Kaisar-i-Hind Medal, followed by a Gold Kaisar-i-Hind Medal.

Her death is a serious loss to the public and the profession.

DR. (MISS) J. GRANT

ERRATA

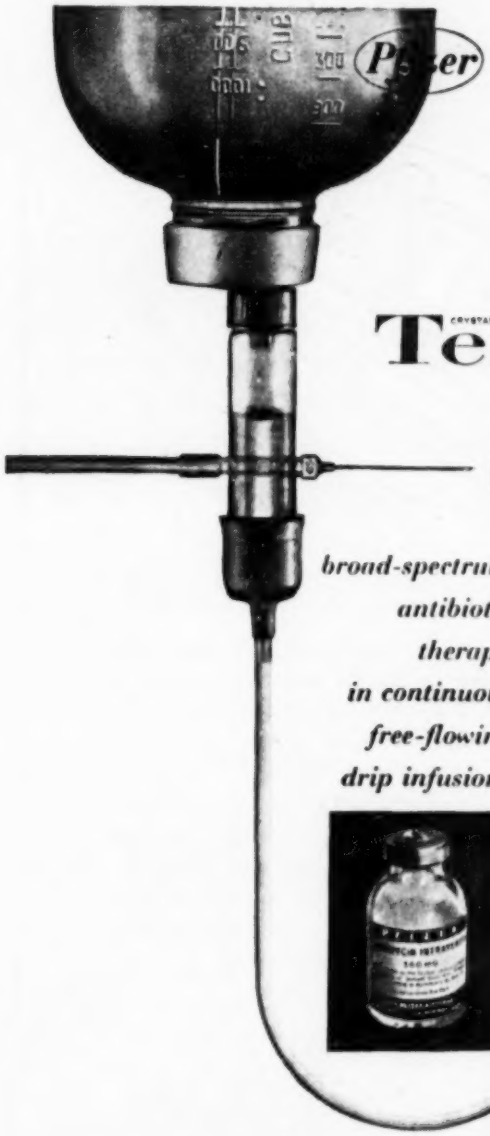
VOL. XXII, NO. 10, JULY 1953 ISSUE:

Page 397, col. 2, graph 1, "Starch 1/2 hr. to 1 hr." *should read* "Starch 1/4 hr. to 1½ hr.

Page 398, col. 1, line 10, "normal about 4·8 ppm." *should read* "normal about 0·8 ppm."

VOL. XXII, NO. 12, SEPTEMBER 1953 ISSUE:

Page 490, col. 2, line 24 from below, "procaine penicillin sodium G" *should* read "procaine penicillin G"; in line 13 from below *add the words* "for ten days" after "one tablet daily."



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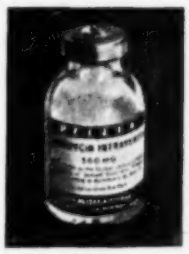

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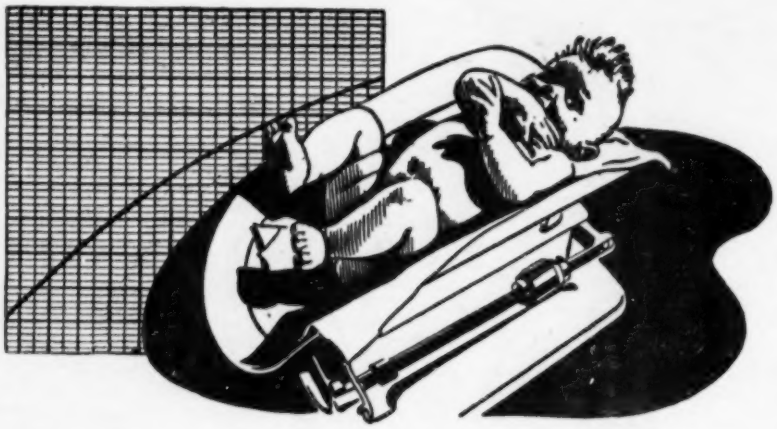

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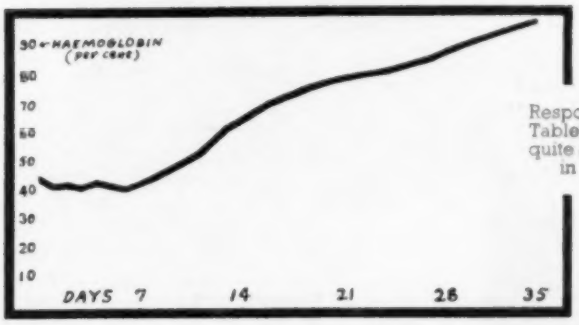

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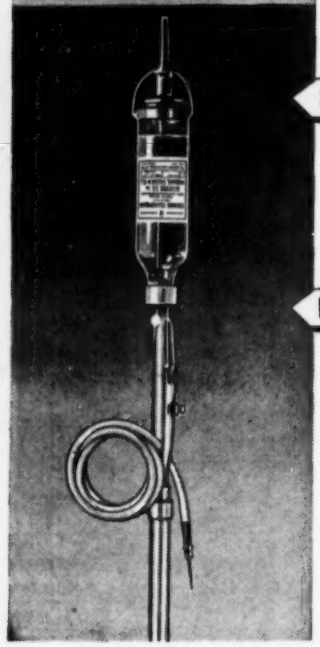

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[1]Scheie, H. G., Tyner, G. S., Buesseler, J. A., and Alfano, J. E., *J.A.M.A. Arch. Ophth.* **45**:301, March 1951.
[2]Leopold, I. H., Purnell, J. E., Cannon, E. J., Steinmetz, C. G., and McDonald, P. R., *Am. J. Ophth.* **34**:361, March 1951.

Literature on request

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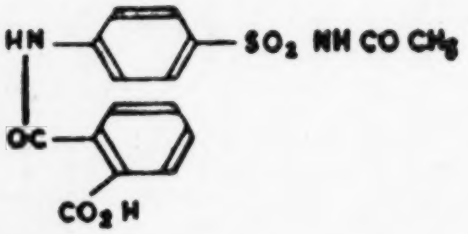

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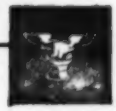

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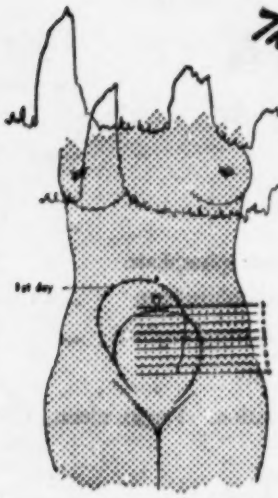

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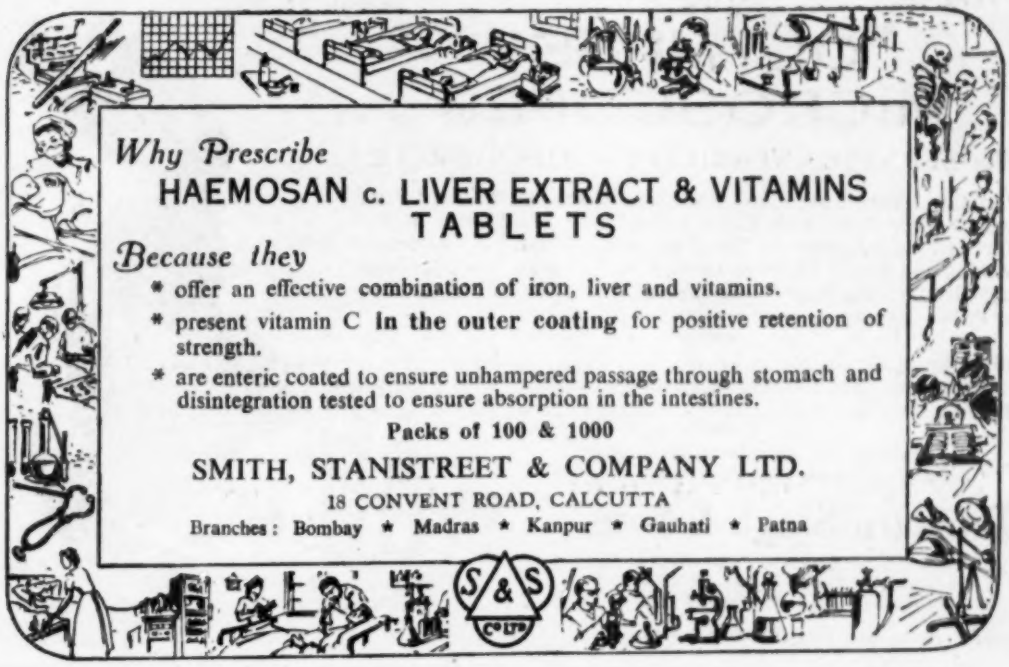
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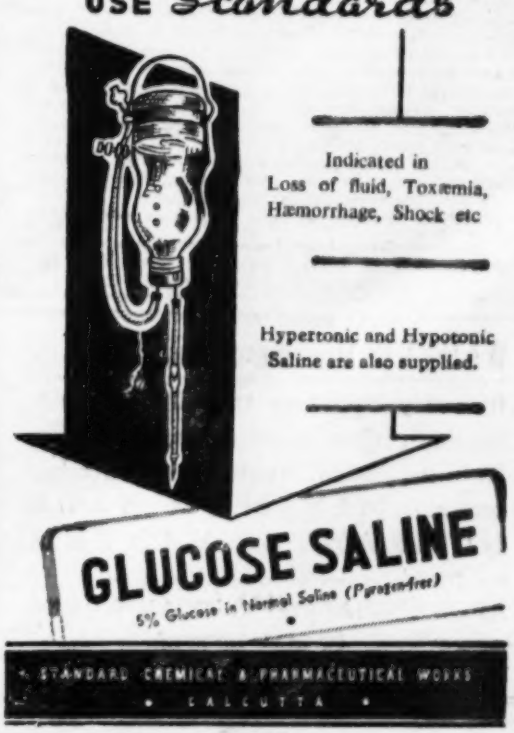
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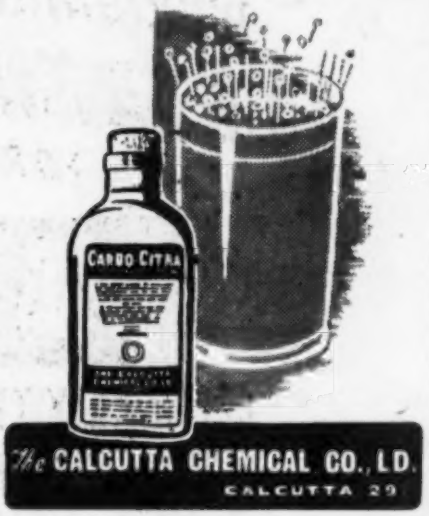

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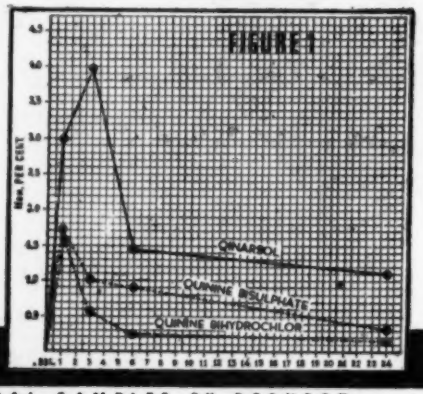

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